ON

DARLINGISM,

MISNAMED ELECTRO-BIOLOGY:

AN ADDRESS

TO THE MEMBERS OF THE MEDICO-CHIRURGICAL SOCIETY
OF GLASGOW,

DELIVERED OCTOBER 14TH, 1851.

BY

ANDREW BUCHANAN, M.D.
PROFESSOR OF PHYSIOLOGY IN THE UNIVERSITY OF GLASGOW.

Moved by JAMES WILSON, Esq. M.D., and seconded by PROF. LAURIE, M.D.

"That the Medico-Chirurgical Society of Glasgow deem it to be their duty to "endeavour to put down a system founded on Delusion, and fraught with Immorality; "and thinking this Address well fitted to promote that important end, RESOLVE that "the same be published at the expense of the Society."

CARRIED UNANIMOUSLY. JAMES WATSON, M.D. *President.*

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TO

THE PRESIDENT,

VICE-PRESIDENTS, COUNSELLORS, AND OTHER OFFICE-BEARERS, AND
TO THE MEMBERS OF THE MEDICO-CHIRURGICAL SOCIETY
OF GLASGOW.

Gentlemen,

Allow me to thank you for the honour you have done me in permitting this Address to be made public with your sanction, and under the protection of your name. To a medical man there can be no higher and more legitimate gratification than to find the opinions he may have formed on any professional subject confirmed and approved of by the only competent judges of them—those who have prosecuted the same studies, and are engaged in the same pursuits. It was to me, therefore, a signal satisfaction to find, that at an unprecedentedly numerous meeting of a Society which cannot but be regarded as a full and fair representation of the Medical Profession in Glasgow, not a single voice was raised on behalf of the delusions of Mesmerism, while each successive speaker denounced the Immorality which it fosters, and indignantly repudiated the Empiricism of which it has been made the cloak. The unanimity of your sentiments upon this subject sufficiently explains to me how Mesmerism has never made the slightest progress among the educated and intelligent part of the public of Glasgow.

Professor Gregory has said of you reproachfully, but most truly, that "not one medical man of any note" in Glasgow has become a Mesmerist. May you long continue to merit that reproach, and to maintain over the minds of your fellow-citizens that control which your intelligence and moral worth entitle you to exercise.

I have the honour to be,

Gentlemen,

Yours most respectfully,

ANDREW BUCHANAN.

13 Moore Place, *October* 24, 1851.

ON DARLINGISM,

MISNAMED ELECTRO-BIOLOGY.

GENTLEMEN,

In the summer of 1850 Dr. Darling was introduced to me by a respected Colleague, with the request that I would examine his experiments and peculiar doctrines, and give a candid opinion respecting them. This I readily promised to do, not merely in compliance with the wish of my Colleague, but because the subject appeared to me an important one, and to fall within my special province as a teacher of physiological science. I accordingly attended two of Dr. Darling's public Lectures, and three private meetings for the purposes of experiment and discussion, and I was myself twice experimented on by him. From these and other sources of information, and being already familiar with the processes of ordinary Mesmerism, I was enabled to form an opinion of the new system. That opinion I deemed it a part of my duty to communicate to my students in a Lecture delivered at the University last winter. I did this, not merely for their instruction in Physiology, but from a higher motive, which now prompts me to bring the subject upon a more public arena, and before judges more competent to decide upon it. I am persuaded that the cause of sound Morality is deeply involved in the opinion which the public forms upon this subject, and the practices thence resulting. Now, there is no mode of influencing public opinion upon a subject of this kind so effectual as through the medium of the members of the medical profession. To them must at all times belong the important duty of supplying information, and directing the public mind upon all physiological subjects; and they may rest assured, that whatever opinions they as a body may form and promulgate upon such subjects will ultimately be the opinions of the intelligent part of the public, and, of course, of the masses who, having no opinion of their own, merely exhibit in their actions a reflection of that intelligence. It is, therefore, not merely as a highly interesting medical inquiry that I am now to urge upon your consideration the subject of this Address, but also as imposing upon you the responsible duty of leading the public mind, and protecting the interests of Morality.

I hope, therefore, to meet with indulgence while I offer a few suggestions to my medical brethren upon this new Mesmeric system. In doing so, I shall first classify and describe the phenomena which I witnessed at the experimental exhibitions of Dr. Darling: and I shall thereafter, with much deference, suggest what appears to me to be the true explanation of them. To complete the subject, it would be necessary also, did your time permit, to examine the operative processes employed by Dr. Darling: but as these do not in any essential respect differ from the processes of many other Mesmerists, this inquiry becomes a general one into the ascertained physiological effects resulting from the processes and manipulations of Mesmerism. In this second part of our subject we descend from causes to their ascertained effects, while in the first we ascend from effects to their causes. But it must not be supposed that these are merely two different methods of developing the same subject: for while the inquiry first indicated belongs almost exclusively to the domain of the psychologist and the moralist, the second is a purely physiological inquiry. The former, too, ought to have the precedence, being necessary, as it were, to clear the ground, that the merely physiological part of the subject, freed from all extrinsic considerations, may be more readily understood.

I merely premise, that I give to Dr. Darling the title under which he was introduced to me, although I am not aware which of the Transatlantic Universities has the credit of having bestowed upon him "the highest honours in Medicine": and that I give the name of Darlingism to the peculiar modification of Mesmerism embraced by him and his followers,—as I believe it to differ from ordinary Mesmerism in the foundation on which it rests, and the much wider range of application of which it admits. The names of Mesmerism and Darlingism, derived from the authors of these respective systems, appear to me much superior to those of Animal Magnetism and Electro-Biology, which imply an analogy between them and the branches of physical science which we name Magnetism and Electricity, of which no satisfactory evidence has yet been produced.

I. PHENOMENA.

At the public and private exhibitions by Dr. Darling at which I was present, all persons were submitted to experiment who came forward for the purpose. A metallic disc about an inch in diameter, and said to be composed of zinc and copper, was put into the left hand, on which the person experimented on was made to stare intently from a quarter to half an hour. On myself no effect was thus produced, except a little giddiness and drowsiness, the latter probably from vacuity of mind, and an uneasy feeling of stiffness about the eyes from interruption of the motion of the eyelids. The operator enjoined upon the whole audience a solemn silence during this preparatory process, at the end of which he went round the persons under experiment, making certain *passes* over the face of each, and directing him in a whisper to keep his eyes shut; and soon after he asked them severally, in the same low tone, whether they could open the eyes. The great majority of them at once opened their eyes, and were declared *insusceptible.* If any one persisted that he was unable to open his eyes, the operator directed more particular attention to him, and after making certain additional passes, declared that the eyes could now be opened, which accordingly happened. After making himself quite sure that all this took place according to his wish, the operator brought the *susceptible subject* forward and repeated the experiment before the audience, making him declare in an audible voice at the end of it, that he was unable to open his eyes till permitted. In this way Dr. Darling effectually protected himself against all imposition from mere feigned assent on the part of those experimented on; for if they afterwards attempted to gainsay their own public declarations, he proved them to have spoken falsely before many witnesses—a mode of self-defence, of which I was informed that while in Glasgow he had occasion to make use.

The operator having now obtained one or more Susceptibles, as I shall hereafter name them for the sake of brevity, proceeded to assert his control over their minds and bodies by the following experiments: which I divide into four classes, according as the organs chiefly affected by them are—the voluntary muscles, the organs of sense, the brain and general nervous system, or the organs of involuntary motion.

Control over the Muscles, and Voluntary Motions.

The control over the muscular system was shown, first, by preventing certain muscles from acting; and, second, by preventing certain muscles from ceasing to act till permission was given by the operator; and in some experiments both sets of phenomena were exhibited.

1st. To the first head belongs the experiment already mentioned, of making the Susceptible keep his eyes shut till permitted to open them; and conversely he was made to stare with his eyes wide open, till permitted to close them. He was made to place his hands on the crown of his head, or to extend them in any other position such that the two hands might be in contact, when they were made to cohere so firmly, that they could not be separated by the utmost muscular efforts made, till permission was given, when the hands were separated at once. The Susceptible was made to assume the sitting posture, and could not get up. He was made to stand rigidly upright, and could not stoop down, although tempted by a sum of money laid on the ground before him, and promised to him if he could reach it, which he vainly strove to do. One exception to this result occurred, when I was present, in the case of a little boy, who suddenly overcame the apparent rigidity of his muscles, and pounced down upon a one-pound note.

2d. As an illustration of the second mode of controlling the muscles, I may mention, that the hands were made to revolve rapidly round each other, and this motion could not be desisted from till the permission of the operator was given.

Control over the Organs of Sense, and Sensations.

The control of the operator over the organs of sense and the sensations was shown in three ways: first, by exciting sensations by the mere word of command, without the presence of any apparent exciting cause; second, by making the ordinary exciting causes produce sensations quite different from those usually produced; and, third, by depriving certain parts of the body of their sensibility, so that the ordinary exciting causes produced no effect.

1st. In the first way, I saw four well-grown lads affected from the mere words of the operator, one with a pain in the hip, another with a pain in the knee, the third with a pain in the ancle, and the fourth with a pain in the shoulder. They applied their hands to the pained parts, and exhibited the appropriate contortions of face and person, as they limped in a row across the stage, to the great amusement of the by-standers. The indications of pain which they exhibited varied from those of a transient pang to those of overpowering agony, according to the words of the experimenter.

In the same way, I saw a young man, declared by the experimenter to be cold, and he immediately began to shiver. The sensation of cold increased till he complained loudly of it, but the only comfort he received was expressed in the words, "You will be colder still, sir; you will fall down from cold:" and, accordingly, with the most pitiful plaints, and a gradual contraction and stiffening of his limbs as if benumbed with cold, the young man at length fell motionless upon his side.

The fabled power of witches and magicians over the victims whom they tormented, was never represented as more terrible and irresistible than the power of the experimenter over his subjects appeared to be in these last experiments.

Allied to the last experiment was that of making a body, held in the hand, feel so hot that it was tossed from one hand to the other, like a red-hot ember, and finally dropped; and that of making the seat on which the Susceptibles were seated, become so hot, that they sprung up, holding and rubbing their hinder quarters as if they had been burned, with appropriate grimaces and exclamations. How merciful to these poor creatures it was in the operator not to conjoin this last experiment with that already mentioned, in which he glued them to their seats!

2d. The second mode of controlling the sensations was exhibited by making water taste like milk, wine, whisky, vinegar, or any other liquid which the operator chose to name—the Susceptible, after tasting the water, declaring it to be those liquids respectively.

3d. Last of all, the operator could deprive the skin and subjacent textures of any part of the body of their sensibility so completely, that no effect was produced by pinching, pricking, or striking the part; and the eye was declared to be insensible to a candle held right before it.

Control over the Brain, and Intellectual Faculties.

The Susceptibles, being told they were in California, imagined themselves to be there; and immediately commenced filling their pockets with gold, picking, digging, and riddling, each according to the ideas he had formed of Californian operations. Being told they were in a flower-garden, they busied themselves making up nosegays, which they smelt to the obvious gratification of their olfactory nerves; or if it was the time of fruit, they pulled apples and pears from the walls, and ate them with all the signs of satisfaction. Being told they had taken too much wine, they immediately reeled, talked nonsense, shouted, and exhibited other marks of intoxication.

Control over the Involuntary Muscles.

It was affirmed by some, that Dr. Darling could control the frequency of the pulse, produce at will the evacuation of the bowels, and render the iris insensible to the influence of light; but I saw no evidence of his possessing any such powers, and he himself spoke to me very hesitatingly with respect to them.

II. CAUSES.

I have thus described the phenomena exhibited by Dr. Darling, his disciples, and coadjutors, as I myself observed them; for in only one or two instances have I trusted to any other evidence. I now proceed to the more difficult task of suggesting an explanation of these phenomena.

But here I am met at the threshold by certain very wise men, who say, "O! give us the facts; that is for us quite enough: we care nothing for your explanations." In so saying, they appear to me not to evince much of the spirit of that philosophy of facts, which they affect to profess and to hold in reverence. To seek for an explanation of any phenomenon, is not to penetrate into its recondite essence, but merely to observe it in a systematic way,—to compare it with other phenomena better understood—to observe how it varies with varying circumstances, and more especially in the least complicated circumstances in which we can observe it, and thus to deduce the laws which regulate its occurrence. Had Sir Isaac Newton been satisfied with accumulating proofs of the fact that apples fall to the ground, without proceeding to examine falling bodies in special circumstances, as by experimenting on the swinging of the pendulum, he never could have deduced the general laws according to which all bodies gravitate towards each other.

"Is there no imposition in all this?" is the question which every one who witnesses a mesmeric exhibition naturally wishes to ask, and to have answered. Putting the question in a more tangible form, it may be expressed thus: "Are the manipulations and words employed by Dr. Darling and other experimenters, necessarily connected with the signal changes which immediately thereafter take place in the minds and bodies of those experimented on, so that the former of these events can be regarded as the efficient cause of the latter?" Now, setting aside the obvious effects which every one experiences, and reserving a few anomalous cases for consideration hereafter, my conviction is, that no such connection has been established; that the manipulations have, directly, nothing at all to do with the effects which ensue; and that the words of the experimenter merely indicate to the Susceptibles what they are to do, but have no direct share in making them do it. My reasons for this conviction are, first, that the whole phenomena are explicable as resulting from ordinary moral causes; and, second, that they are quite inexplicable according to any known physiological laws, but on the contrary, are in opposition to those laws: which is exactly the twofold division of the argument established at the outset.

I would first remark, that all the bodily and mental states in question, without exception, are of a kind that may be either feigned altogether, or voluntarily assumed. Of the first kind is the existence of pain in any part of the body, which no one can declare but he who actually feels it, and who, it must be admitted, may say he feels it when he feels it not. Of the second kind is the power of calling certain muscles into action, or of restraining their action when once set agoing. None, but he to whom these muscles belong, can declare whether he has or has not the power to make them act, or to restrain their action. The whole of the phenomena, then, of both classes, rest on the testimony of the persons experimented on, as the evidence by which their validity is established; and, except in a single instance to be particularly adverted to hereafter, there is no other evidence by which their validity can be established.

There is also this important peculiarity in the evidence from testimony, that each experimental result is attested only by a single witness; and cannot, from the nature of the case, be attested by more than one: for the consciousness of each individual belongs to himself alone. However numerous, therefore, the witnesses may be, the testimony of no two among them relates to the same event, but to separate and independent events, each of which is attested only by one witness.

Seeing, then, that the whole doctrine rests upon testimony, and, except in a single instance, upon testimony alone, and that there never can be more than one witness to each supposed result, it is necessary to look well to the witnesses by whose testimony the results are established. What, then, is the character of these witnesses? The great majority of them are women and children. The reason of this, it will be said, is, that the nervous system in women and children is more mobile and impressible than in adult males. With the explanation I have at present nothing to do, but only with the fact.

If, indeed, we include under this head all males under the age of puberty, we shall have at least nine-tenths of the whole witnesses, that is, of the whole Susceptibles in any community. But there were adults of the male sex who were found susceptible; what was their character? I answer by an illustration which I myself witnessed. I saw twelve gentlemen and twelve apprentice lads ascend the stage together, to be operated upon. In giving them these names, I judged altogether from their dress and appearance, as the operator seemed also to do when he placed them in two ranges opposite to each other. Now, while he did not in any one instance succeed with the gentlemen, he succeeded completely with every one of the twelve apprentice lads, although he was obviously very anxious to succeed with the former, and gave to them almost solely his attention and manipulative efforts. How, I would ask, are we to explain this extraordinary difference of results, if it was not due to a difference of character and moral feelings in the two classes of persons experimented on, corresponding to the difference in their education, age, and position in society. Last of all, I believe it to be conformable to observation, that the most susceptible persons of both sexes are those of weak intellect, and those who have weak nerves, or some actual disease of the nervous system.

Such, then, is the character of the witnesses. It is upon the testimony of persons of immature age and unformed character, or in a state of mental imbecility, of the weakest of the weaker sex, and of the weakest and least respectable of our own, that we are asked to believe in things unheard of in any former age, and which, if true, would disturb the established relations of man to man, and shake civil society to its centre. It would require evidence of a somewhat different character to make any physiologist believe it possible that any one man can so completely subjugate the mind and bodily organization of another, as to make him will as he wills, think, speak, and act, solely as he directs, deprive his nerves of their sensibility by a word, and inflict upon him at pleasure, and for any length of time, the most excruciating torments.

But, it will be asked, if Dr. Darling and his coadjutors had no power to subjugate the minds and bodies of those on whom they operated, how did it happen, for unquestionably it did happen, that so many individuals of both sexes and of all ages appeared subject to them, and yielded to them an implicit obedience? The question is certainly a most difficult one, but it may, I think, be resolved according to the acknowledged principles of human nature, and the lessons of experience.

Whenever a general belief prevails in the existence of some mysterious and invisible power capable of affecting the condition of the human body or mind, independent of all effects produced by the invisible power itself, supposing it to be real, the belief in its existence, whether it be real or imaginary, produces certain very remarkable effects both on body and mind, which exhibit a great degree of uniformity, and are as widely diffused as the belief in which they originate. These effects are of two perfectly distinct kinds, according as the intellectual or the moral part of our human nature is first implicated, and becomes the prime mover in the series of changes which ensue. In cases of the former kind, where the intellect is first implicated, there is invariably a genuine belief in the existence and potency of the mysterious influence supposed to predominate, and that intellectual conviction reacting on the moral nature and bodily organization, excites fear, enthusiasm, and imitation, with their bodily concomitants. In cases of the second kind, again, the belief in the existence or power of the mysterious influence, is always to a certain extent feigned, and in so far the phenomena exhibited, bodily and mental, are under the control of volition, and originate in a deficiency of moral principle; but to the credit of human nature, it is to be remarked, that it is very rare indeed, unless it be in the case of hired impostors, that we witness the disgusting spectacle of this second element operating alone, for it is almost invariably combined with more or less of the former element, so that the basis of the whole superstructure is a half-convinced and bewildered understanding. I shall, for the sake of illustration, adduce a few instances in which these two principles, or impulses, as perhaps I should rather name them, operate sometimes separately, but much more commonly variously combined.

Of the former principle operating altogether alone, or without the latter, seasons of epidemic pestilence afford striking examples, as the present generation have twice witnessed during the visitations of malignant Cholera. Men saw friends and relatives snatched from before their eyes, whom but a few hours, or even one hour before, they might have seen in apparently perfect health. The number of deaths reported daily, and the suddenness of most of them, left no doubt in the mind of any one, of the existence of some invisible and mysterious influence inimical to human life. It mattered not what idea was entertained of that influence —whether it was thought to be a miasmatic poison emanating from the soil, a contagion arising from the bodies of the sick, a disturbed state of the Imponderables, or simply the hand of an avenging Deity.

Whatever it was, all felt that it was a power unquestionably real, and against which the strongest constitution afforded no protection. This appalling conviction overpowered the minds of many, and reacted violently on their bodily frames. Every physician was sent for to see patients, supposed to be ill of the epidemic, but who laboured only under the effects of fear; which prostrated the mind, enfeebled the muscles, rendered the pulse rapid and weak, and the extremities cold, and not unfrequently also brought on diarrhœa; thus producing a severe bodily ailment, and rendering much care often necessary to distinguish the true effects of the epidemic poison from those of the terror which it inspired.

The superstitious notions—whether resting on a real or on an imaginary foundation—which prevail in times of ignorance, afford examples of the effects of a genuine conviction becoming gradually blended with the spurious manifestations of a feigned belief. Such is the superstitious belief in ghosts, demons, and other supernatural influences.

The persuasion that the dead can revisit us, has been known to produce upon the body the most formidable effects, and even to extinguish life. It is a notion which is seldom feigned, and which is without doubt eminently congenial to the human mind; since even persons fully convinced of its vanity, and not deficient in firmness of character, when placed in circumstances fitted to awaken it, cannot banish it from their minds, or reason down its influence over their bodies.

The belief in the power of demons to enter into and take possession of the frame, if less deeply implanted in human nature than the former, and often feigned from various motives, is nevertheless capable, when fully accredited, of reacting powerfully upon the mind and bodily organization. During the dark ages, when the belief in evil spirits taking up their abode in the bodies of men was universal, it gave rise to epidemic affections of the muscular system—convulsions and frantic gesticulations, the genuine offspring of the appalling idea that an evil spirit had gained possession of the frame. But such affections were always seen alongside of cases of a totally different kind, in which the muscular movements were more or less entirely voluntary, the manifestations of a feigned belief in the supernatural agency. Hecker's well-known history of the "Dancing Mania" shows the extent to which this delusion prevailed: but it does not enable us to estimate how much was the genuine effect of the mental delusion, and how much was spurious, in the extravagancies of those who danced at the festival of St. John, or were exorcised at the shrine of St. Vitus.

If the supernatural agency, instead of being the work of devils, is supposed to be divine, it is easy to perceive what motives will prompt many to make it be thought that they are the subjects of this divine influence, and to magnify and display ostentatiously its effects upon them. But amid the crowd of insincere votaries—of those, for instance, who celebrated the orgies of Bacchus or the mysteries of Isis—it is conformable to the principles above laid down to suppose that there were a few whose minds and bodies were in reality overpowered with devotional fervour, the offspring of their genuine belief in a present and inspiring Deity. The author above cited ably depicts the symptoms, mental and bodily, arising from religious enthusiasm.

In the preceding examples, the phenomena resulting from any widely prevalent impressions on the human mind are exhibited under a twofold character—as originating in a genuine belief, or in a feigned belief. In the examples first adduced, the former element operates alone; in those which follow, the latter element becomes more and more predominant; and we now come to the opposite extreme, where the element of genuine belief, in its unmingled form, almost entirely disappears; and in one of the most extraordinary series of phenomena ever witnessed in a civilized age, we trace on all sides the operation of a feigned belief; although, as already stated in extenuation of human weakness, originating in almost every instance, except that of hired impostors, in a more or less excited and bewildered understanding.

In applying these principles to the subject before us, I must, in the first place, show in what respect the influence wielded by Dr. Darling and his coadjutors resembles the purely mental influences just adverted to.

There is a marked difference between ordinary Mesmerism, and the modification of it practised by Dr. Darling. In the former all direct mental influence is excluded, and all experiments are carried on according to the strict rules of a physical science, or at least under that guise; the great object of the experiments being to establish the existence of a physical principle which produces certain effects upon the person experimented on, independently of all communication through his mind, the mere suspicion of which would at once destroy all faith in the experiments. In Dr. Darling's system, again, "mind acting upon mind," is the fundamental principle of every experiment. He publicly professed himself, in my hearing, unable to produce any effect without first communicating to the Susceptible what he was about to do. The adoption of this principle is the master-stroke of Dr. Darling's system. By adopting it, he at once freed himself from the inconvenient restraint of the laws of physical investigation, and rendered his experiments successful in every mind in which ignorance, credulity, vanity, or deceitfulness had a place. Hence the wide popularity of his system.

While the adepts in the ancient Mesmerism had the utmost difficulty, even in a large city, in finding one or two susceptible subjects, Dr. Darling finds scores of them in every crowd which assembles to witness his miracles.

But if Dr. Darling's influence be altogether mental, what is the use of the manipulations which he employs? That they are of no direct use is obvious, for he often operated without them; indeed, with all tried subjects, that is, with those who had already publicly exhibited themselves as his dupes, and could not, without discredit, draw back, he dispensed altogether with the farce of employing them. But they are, nevertheless, indirectly of the highest use, by engendering the mental delusion which is the foundation of his power with the uninitiated. During the quarter or half hour's solemn silence enjoined upon the whole audience, while those under trial stared intently on their metallic discs, a belief came to prevail, that from these discs, or from the person of the operator himself, there emanated some mysterious and irresistible power. What idea was formed of that power may be thought of little consequence; but it has been described to me as having been felt streaming down the limbs just like the current from a galvanic trough—an idea most probably arising from the internal sensations perceived in the muscles of the limb, on the mind being directed intently towards it, and which the imagination could easily fashion into that shape. But, in whatever way originating, I believe the idea generally formed of the power in question to be what most Mesmerists profess themselves to entertain, and which their manipulations and modes of speaking are obviously intended to suggest, that it resembles more or less that wonderful power which has been long known to pervade all nature, and to give its terrors to the thunderbolt; and which in our own day has annihilated the elements of time and space in our written communications, and so given the speed of lightning to human thought: whence the minds of men are fully prepared to receive fresh discoveries without distrust, and almost to deem nothing too arduous to be achieved by it.

To some such belief, recommended to each by his own peculiar modes of thinking, the weak-minded, the timid, and the ignorant, partly from conviction, and partly through fear, confusion of mind, or mere love of the marvellous, yielded an unreserved assent; while it cannot be doubted, after the analogies above cited, that a much larger number feigned a belief of the same kind, which they employed as a cloak to gratify vanity, love of display, and similar feelings. They were not slow to perceive that these darling passions might be indulged in with impunity, since they saw others indulge in them to the uttermost without exciting either derision or indignation, but, on the contrary, calling forth universal applause, and being hailed as something marvellous and superhuman.

To those who know human nature, it will not, I believe, appear at all surprising, that if a pleasure be held out which can be indulged in not only with impunity but with applause, very many persons should so indulge themselves without analysing very nicely, or indeed caring much about the conditions implied by the indulgence.

It remains only therefore to show, that the gratification held out and sought after, is an adequate one. Now who will say that is not an object of ambition with many to be thought made of finer mould than their fellow-creatures,—to have more delicate nerves, and a nice susceptibility of impressions, not perceived by grosser natures? Who will say that there are none who care to exhibit on a platform, to be the great object of attraction to a large audience or to a drawing-room circle, and to become the leading topic of conversation thereafter? Such indeed is the thirst for notoriety in the human mind, that every physician has met with cases in which even diseases, that is, bodily or mental infirmities, have been feigned for no other discoverable motive than the notoriety thereby attained. Of this, let the following be an example:—

In the year 1827–8, a rumour reached Glasgow of a young woman near Kilpatrick being affected with a black sweat, which dyed her whole body of a black colour. This affection, from its singularity, naturally excited much attention and speculation in medical circles, and had even become a topic of general conversation and interest in the surrounding country. Learned men found notices of similar diseases in the records of Physic, and the Greek name of Melanhydrosis was bestowed upon it, under which it might probably have had a place assigned to it in all succeeding systems of Nosology, but for the sequel of this history.

On the 28th of Jan. 1828, four medical gentlemen of this city, the late Dr. Young, the late Dr. Auchincloss, Dr. M'Farlane, and the narrator set out for the purpose of seeing with their own eyes this extraordinary case. Having previously communicated with the medical attendant, they met him at Kilpatrick, and accompanied him pretty high up the Kilpatrick hills, where, in a picturesquely situated cottage, they were introduced to the patient. They found that, contrary to what usually happens, rumour had greatly under-estimated the blackness of the case: for not only was the woman's skin as black as that of a blackamoor from head to foot, but the urine and stools, which the surgeon had with a praiseworthy zeal ordered to be preserved for inspection, were as black as ink. But what astonished them most of all was that a plate of blood, which had been drawn the day before for the relief of the patient, was as black as the excretions, the serum being like ink, and the coagulum of a dusky hue.

So far every thing corresponded to or exceeded the accounts which had been received, and the new disease seemed likely to turn out a case of universal Melanosis; for not only were the excretions black, but the purple tide from which they all proceed had the same black taint. A case more complete in all its symptoms could not well be conceived. Still, however, the visitors were not satisfied; for we are proverbially a race of sceptics. So the public says of us, reproachfully; but we understand the matter better. Accustomed every day of our lives to be deceived and imposed upon, we at first arm ourselves with incredulity in self-defence; till at length it becomes with us a habit founded on the conviction, that in Medicine so far as it rests upon testimony, all true knowledge is the offspring of philosophic doubt.

It was found that the skin could be freed of its black colour by means of soap and water, and a large portion of the woman's back having been so purified, it was resolved to watch the progress of the black exudation: the visitors keeping guard over her by turns, while the rest gathered zeolites in that famed locality, or otherwise amused themselves. For some hours no change could be discovered; but at length, when the late Dr. Young was on guard, he saw the woman get up upon her hands and knees, and move about under the blankets in a way that excited his suspicion. He accordingly darted forward, and seizing the woman's hand, discovered in it a ball of dyer's blue.

The woman acknowledged the imposition, for which no motive could be discovered but the gratification of a morbid thirst for notoriety.

There is still another form of delusion of mind, which produces many converts to Mesmerism in all its modifications; but I have purposely separated it from the rest, as it is too sacred and respectable to be mixed up with aught that can move laughter, or excite the graver feelings of contempt and indignation. To understand this delusion, we must enter the chamber not of feigned, but of real sickness, and suppose—what happens every day—that a protracted and perhaps painful disease has baffled the skill of the physician, and exhausted all the resources of his art. In such circumstances, there is nothing more natural than for the patient and his friends to try another and another physician; and if they all concur in speaking doubtfully of the result, or declare the disease to be incurable, still, it is in human nature to cling to hope; and thus, occasionally, the door is thrown open to the numerous tribe of deceivers who prey upon afflicted humanity, and among the rest, ready at the summons, comes the arch-deceiver Mesmerism. It would exceed belief, were I to tell, that there are educated men who intrust the health and lives of themselves and those dear to them to some "clear-seeing girl," who either visits them or merely corresponds with them, and whom they in perfect seriousness believe to have the power of seeing into the interior of their bodies, and telling both what disease they labour under and what should be done to remove it. The fact, however, is, that this is done in the middle of the nineteenth century in this country, and done by educated men; for it is only in educated circles that this form of madness has hitherto shown itself. Now, it is very easy to form an abstract opinion of these and other similar delusions, the brood of Empiricism;

but it is a very different thing indeed, as all who have tried it will attest, to express that opinion in the hearing of the patient. When we try to do so for the first time, we find, to our surprise, that our hearts and our heads are at open variance; and we are constrained to acknowledge how truly pardonable those delusions must be, which our tongues would refuse their office were we to attempt to condemn. I know that I address those who have been placed in the painful predicament of being compelled to disguise matured opinions, or even to mumble out a few words of dubious commendation as to some proposed remedy or mode of treatment, rather than do what humanity recoils from—dash the cup of hope from the hands of a dying man.

To conclude my analysis of Darlingism. Some of my medical friends are disposed to adopt the view, that it may depend on a weak and disordered state of the nervous system, such as we observe in somnambulists and monomaniacs. Now, that organic alterations of the brain and nerves, and functional diseases of the nervous system from whatever cause proceeding, do actually play a most important part in producing the phenomena under consideration, I have no doubt; but I apprehend them to do this simply on the two principles above laid down, either by rendering the intellect weak and easily perplexed and stupified, or by blunting and perverting the moral feelings. But the advocates of this theory urge farther, that in certain unusual conditions of the nervous system, most commonly the result of disease, there is a susceptibility of impressions which are either not perceived at all, or are perceived quite differently by nerves organized more rudely, although more according to the healthy standard; and that in this way the gifted individuals whose nerves are so constituted, experience feelings, and become endowed with energies both of mind and body, which cannot be judged of according to the laws which govern the nervous system in ordinary men. Now, this is obviously a purely physiological doctrine, which will be more appropriately discussed hereafter. I therefore in the meantime merely remark, that out of the total number of Susceptibles, there are not many who are known to labour under diseases of the nervous system, or who exhibit any cognizable indications of having nerves more finely organized than those of other men and women, but that for their benefit, I shall in the meantime admit the explanation proposed above. I do this, because I am anxious to leave open as many doors as possible through which an escape may be made without discredit by those who may have been foolish enough, through a misplaced love of applause or mere imitation, to exhibit themselves as Susceptibles, without duly considering how much their character as men of sense and probity might suffer thereby.

Taking then into consideration the different explanations proposed above, I think we shall not greatly err in estimating, that of one thousand Susceptibles, or persons affected under the new mesmeric system, ten, or one in a hundred, were complete impostors—a proportion much less than at the exhibitions under the old mesmeric system, where there was commonly only one Susceptible: and that one either hired and carried about by the operator; or a "wonderful girl" from some of the neighbouring factories, supported by the ingenious persons who had discovered her gifts. A much larger number, two hundred at least, must be regarded as having spoken and acted in direct opposition to their feelings and conviction; but of them a more lenient judgment will be formed, when we consider, that most of them were boys or very young persons, who looked upon the whole exhibition in no other light than as an amusing game, in which they were privileged to join along with their seniors, and some of whom were, I believe, influenced by an amiable desire to please their parents, guardians, or teachers, who operated personally, or were at least known to the quick-sighted urchins as having a leaning towards Mesmerism. By far the larger number, estimated at seven hundred and forty, were more deceived than deceiving; they imagined that the operator had filled their bodies with animal magnetism, or some other mysterious power which they could not resist, and before they were well aware, they had committed themselves to such an extent, that to retreat was more difficult than to advance; in so far, therefore, we can impute to them nothing more than a mere error of judgment, or a want of self-possession, with consequent obfuscation or suspension of their mental faculties: but it would be carrying charity too far to say the same of those who, instead of continuing in the stolid state throughout, regained the possession of their mental faculties so completely, as to indulge in wit and repartee, see an adored object conjured up by the operator, kiss it and bow to it, sing songs, deliver speeches, and, in short, cut a decided figure upon the platform. I insist particularly upon the fundamental importance of this distinction, between those who continue in the stolid state throughout, and those who emerge from the stolid into the "lucid" state; although I am unable to assign numerically the proportions which they bear to each other and to the whole. Last of all, fifty, or five per cent., a proportion probably too high, but intentionally taken in excess, may be considered as labouring under disease of the nervous system, or as having more delicate and impressible nerves than other men. The result is therefore as follows:—

Want of Moral Principle,	10
Weakness of Moral Principle,	200
Weakness of Intellect, alone,	740
Weakness of Intellect, combined with Moral Weakness,	
Weakness of Nervous System,	50
Total Susceptibles,	1,000

I never witness a mesmeric exhibition without much pain, as I look upon it as a lamentable picture of human weakness. I am very far from thinking that in the preceding analysis I have over-estimated the element to which the moralist will look with most interest. That interest will not be merely of a speculative kind, when he considers the number of mesmeric exhibitions which have taken place during the last eighteen months, and are still taking place in this city, and throughout the whole country. He will then see that he has to deal with a practical question, and with practical duties arising out of it; and if he views that question as I view it, he will not withhold his more powerful influence in aid of my humble attempt to put down, by rendering disreputable, the meetings for mesmeric purposes which are now nightly held in this city and elsewhere, to the great detriment of the morals of the community.

It is needless for me to add, that with a few very narrow limitations, I regard the act of mesmerising as a grave moral offence, seeing that it tends to seduce the minds of the young, the ignorant, the weak, and the vain, from their allegiance to truth.* It is more peculiarly censurable when practised by parents upon their children, by teachers upon their pupils, by masters upon their dependants; and, generally, by persons of superior attainments, character, rank, or position in society, who exercise a powerful sway over the minds of those beneath them. It is most of all censurable when practised by medical men, whose fancied acquirements, associated as they are in the minds of the vulgar with death and dissection, have always been regarded by them with a superstitious awe, which assists powerfully in propagating the mesmeric delusion. I myself never mesmerised any one, and would on no account attempt to do it; but I feel confident, that if I were to proclaim myself a Mesmerist to-morrow, I should get at least a few foolish people to enact all manner of absurdities, under the pretext that I made them do it.

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* Although morality is one and immutable like the truth on which it rests, yet it must be admitted, so long as fallible mortals hold opinions diametrically opposed, that they may follow opposite courses of action without blame. It is scarcely necessary, therefore, for me to say, that I am far from imputing moral delinquency to all those who practise Mesmerism.

While I decline personally all interference with persons in the mesmeric state, I shall conclude by suggesting an experiment which will satisfactorily refute the whole doctrine, and for which the only qualifications necessary on the part of the experimenter are, that he have a muscular arm, and a thorough disbelief in Mesmerism. The experiment touches the system at the only point where it is accessible to experimental investigation. I have already pointed out that it is a peculiarity of Dr. Darling's system, that of all the conditions of body and mind which he holds himself out as capable of producing, there is only one which admits of having its existence established by any other evidence than the mere assertion of the person mesmerised. That exception becomes, therefore, most important both to the Mesmerists and their opponents, as affording the most trustworthy evidence either for or against the system. If a man affirm that he has a pain in his head, there is no mode of directly testing the truth of his assertion. If he affirm that he cannot move his arm, so long as he commands his muscles to be quiescent, no one can impeach his veracity. But if he affirm that his hand, or any other part of his body is destitute of sensibility, that assertion can be tested by unequivocal means. Now the experiment may be conveniently made upon the back of any young lad under sixteen years of age, which answers well, as young persons of that age are the most numerous of all mesmeric subjects, and are agreed by adepts to be the best. Suppose then the young susceptible to be duly mesmerised. Let him first be made to feel very hot, and then showing him a cool and refreshing stream, let it be suggested that he should go in to bathe, when he will proceed to denude himself of his upper garments. The process of denudation is to be arrested when he is naked as far down as the middle, or the operator may employ any other artifice or means he chooses to bring him into the same condition. The preliminary arrangements being made, the young Susceptible is to have his feet mesmerised and so made fast to the floor, his mouth and organs of articulation are to be mesmerised so that he cannot cry out, and his hands are to be fastened mesmerically above his head, exactly as if he were tied up to the halberts; last of all, his back is to be most carefully mesmerised, so as to deprive it of all sensibility from the nape of the neck to the lowermost dorsal vertebra, and across the shoulders to the insertion of the deltoid muscles on either side. These preparations might seem ominous of evil to the young Susceptible, were he not fully convinced that he can feel no pain, and the same conviction will induce every believing parent or guardian to resign his son or ward to the experimental test. The result of the experiment will, however, show that there are no less than four deviations from the "straightforward path" of the "first of virtues" in this common mesmeric exhibition. It will show that the young Susceptible can draw down his hands, and that right quickly; that though his feet be fastened to the floor, he can scamper off to the furthest corner of the room; that though his tongue be mute, he can cry out for mercy; and that though his back be insensible to pain, he will not wait long to have its sensibility tested. The only instrument required in this experiment is a hazel sapling, not more than four lines in diameter at the thickest part, but tough and flexible. Twenty-four stripes should be bargained for, but descending as they will do from an arm uplifted and nerved by a spirit of the most obstinate unbelief, they will be administered with such right good will that the twenty-fourth or twelfth part of the whole number will be all that is necessary.

Should this experiment not succeed in ninety-nine cases out of a hundred, I promise to recant publicly the errors into which I have this night fallen, and to believe in Mesmerism ever after.

POSTSCRIPT.—*The Author having finished his proposed analysis of the new Mesmeric system of "mind acting upon mind," proceeded to give a sketch of the second part of his subject, comprehending an inquiry into the physiological effects of the processes of Mesmerism, and a few remarks on some recent publications on this so-called science: but this sketch being too brief to be at all commensurate with the importance of the subject, is for the present suppressed.*

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REMARKS

ON THE

SUPERINDUCTION OF ANÆSTHESIA

IN

NATURAL AND MORBID PARTURITION:

WITH

CASES ILLUSTRATIVE OF THE USE AND EFFECTS OF CHLOROFORM IN OBSTETRIC PRACTICE.

BY

J. Y. SIMPSON, M.D., F.R.S.E.,

PROFESSOR OF MIDWIFERY IN THE UNIVERSITY OF EDINBURGH, AND
PHYSICIAN-ACCOUCHEUR TO HER MAJESTY IN SCOTLAND.

> Serve me—as Mandragora—that I may sleep.
> WEBSTER'S DUCHESS OF MALBY.
>
> But there is
> No danger in what show of sleep it makes,
> More than the locking up the spirits a time,
> To be more fresh, reviving.
> SHAKESPEARE'S CYMBELINE.

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ON THE

SUPERINDUCTION OF ANÆSTHESIA, &c.[1]

Among the many improvements by which the operative part of medicine has, from time to time, been enriched, few or none have exerted a more potent, or a more beneficial influence over its advancement and progress than the introduction, in the 16th century, of the application of ligatures to arteries, with the object of arresting the hemorrhage attendant upon surgical wounds and operations. Previously to that time, surgeons had no other means of stemming the flow of blood—after amputation of the limbs for instance—than by scorching over the raw and bleeding wound with a red-hot iron, or by plunging it into boiling pitch, or by applying strong potential cauteries to its surface. With laudable efforts to diminish the fearful severities of their practice, they exerted their ingenuity in devising, as it were, refinements upon these necessitous cruelties. Thus Hildanus, the patriarch of German Surgery, amputated the limbs of his patients with red-hot knives, in order that he might divide the flesh and sear up the vessels at one and the same time. Upon all these practices, the great and happy suggestion of Ambrose Paré, viz. to shut up the bleeding vessels, by constricting or tying them with slender ligatures, was a vast and mighty improvement. It at once made the arrestment of hemorrhage in operations far more simple, more certain, and more secure. It saved immeasurably the sufferings of the patients, while it added immeasurably to their safety. But the practice was new, and an innovation; and consequently, like all other innovations in medical practice, it was, at first and for long, bitterly decried and denounced. The College of Physicians of Paris attacked Paré for his proposed new practice : they attempted, by the authority of the French Parliament, to suppress the publication and dissemination of his observations : and, for nearly a long century afterwards, some of the Hospital Surgeons of Paris continued, with the characteristic obstinacy of the profession, to prefer cauterizing bleeding arteries "with *all* the ancients," rather than simply tie them "after the manner of a few ignorant and presumptuous moderns."[1] "Without" (writes the late Mr John Bell) —"without reading the books of these old surgeons, it is not possible to imagine the horrors of the cautery, nor how much reason Paré had for upbraiding the surgeons of his own time with their cruelties. . . . The horrors of the patient, and his ungovernable cries, the hurry of the operators and assistants, the sparkling of the (heated) irons, and the hissing of the blood against them, *must* have made terrible scenes ; and surgery *must*, in those days, have been a horrid trade."[2]

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[1] Read to the Medico-Chirurgical Society of Edinburgh, at their meeting on the 1st December 1847.

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[1] All writers on surgical history give more or less full details upon this opposition to the practice of Paré. Thus, for example, Professor Cooper observes, " By many surgeons, however, the tying of arteries continued to be deemed too troublesome, and hence they persisted in the barbarous use of the actual cautery ; of this number were Pigrai, F. Plazzoni, and P. M. Rossi. Nay, so difficult was it to eradicate the blind attachment shown to the ancients, that Theodorus Baronius, a professor at Cremona, publicly declared, in 1609, that he would rather err with Galen than follow the advice of any other person. . . . I shall not here expatiate upon the ill-treatment which Paré experienced from the base and ignorant Gourmelin, president of the Parisian college of physicians ; nor upon the slowness and reluctance with which the generality of surgeons renounced the cautery for the ligature. . . . Almost 100 years after Paré, a button of vitriol was ordinarily employed in the Hotel Dieu at Paris for the stoppage of hemorrhage after amputations ; Dionis was the first French surgeon who taught and recommended Paré's method. This happened towards the close of the 17th century, while Paré lived towards the end of the 16th."—*Cooper's Dictionary of Practical Surgery*, 7th Edit. pp. 46, 47. See also *Sprengel's Histoire de Médecine*, Vol. III. p. 315 ; *Bell's Surgery*, Vol. 1. p. 226, &c.

[2] Principles of Surgery, Vol. 1. p. 212.

The sentiments which Mr Bell here expresses are those with which the human mind often *looks back* upon our opinions and practices, when these opinions and practices are past and gone, and have become mere matters of history. In the above, as in many other instances, we never become fully awakened to the cruelty and enormity of some of our established doctrines and doings, until, from time to time, an advance is made in civilisation or science, and we find that this or that doctrine and practice, with all its attendant sufferings and inhumanities, was in reality utterly unnecessary, and utterly uncalled for.[1] In general, however, long years elapse before this new aspect of matters is duly seen; or, at least, duly acknowledged. While the practices themselves are in full operation, the mind, enthralled by education and habit, cannot be easily made to view them in their true character; and when, in the progress of the march of knowledge and science, their propriety and perpetuation come at last to be challenged and contested, human passions and prejudices ever (as in the above instance of cauterization) rise up to argue for, and insist upon, the continuance and safety of the past, and the total impolicy and high peril of any attempted alteration. But time passes on, and brings with it, sometimes abruptly—generally almost imperceptibly—a perfect change of doctrine and practice. Any surgeon who, in the days of Paré, dared to arrest the hemorrhages from his amputation wounds, by applying ligatures *instead* of red-hot irons, would have been denounced by his compeers. Any surgeon, on the contrary, who now, at this present day, dared to arrest the hemorrhages from his amputation wounds, by applying to the bleeding vessels, not ligatures but red-hot irons, would as certainly be denounced by his compeers, and his talents, as well as his humanity, would be strongly challenged. We look back with sorrow upon the pitiless practices in that respect of the contemporaries and opponents of Paré. In the course of years our successors in the profession will, I most sincerely believe, look back with similar feelings upon the alleged "insignificance," and "propriety," and "desirability" of pain in surgical operations, as maintained by many members of the profession at the present day; and they will equally marvel at the idea of men—of humane men—complacently confessing and upholding, that they prefer operating upon their patients in a waking instead of an anæsthetic state; and that the fearful agonies which they thus inflict—the agonies of the surgeon's knife—should be endured rather than avoided—quietly and decorously submitted to, and not attempted to be eschewed. I have elsewhere discussed,[1] at some length, the strange opinions and practices of some modern surgeons, upon this alleged propriety and necessity of pain in surgical practice and surgical operations. On the present occasion, my object is to offer some remarks regarding the pains attendant upon parturition, and the propriety of alleviating and annulling the sufferings of our patients in obstetrical practice and obstetrical operations. But let me first adduce some evidence of *their* intensity and amount.

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[1] Witness, for example,—(as compared with the *past* opinions of those who practised them)—our *present* opinions regarding the burning, by our Druidical forefathers, of whole wickerfuls of living human beings, and in the name of religion; or, in times nearer our own—in Christian times—the application of the fire and fagot by man to man, still under the plea of religion; or the use of the rack and torture; the incremation in the sixteenth and seventeenth centuries of many poor wretches for the alleged crime of witchcraft; the altered existing ideas regarding the required frequency of capital punishments, and the whole question regarding their policy; the recent rapid and complete change of doctrine regarding the horrors and inhumanity of slavery; the changes in practice regarding insanity from what it was in the last century, when chains and a dungeon were the portion of every poor lunatic; &c. &c.

"The distress and pain (observes Dr Denman [2]) which women often endure while they are struggling through a difficult labour are *beyond* all description, and seem to be more than human nature would be able to bear under any other circumstances." But even the amount of agony endured in most cases of *natural* parturition, is abundantly severe.[1] Viewed apart, and in an isolated light, the total sum of actual pain attendant upon common labour is as great, if not greater, than that attendant upon most surgical operations. It is, I believe, education and custom, and perhaps the idea of its inevitable necessity, which have made the profession in general look upon the degree of maternal pain and physical suffering accompanying natural parturition, as less deserving of consideration than in reality it is. These circumstances have, in a great measure, blinded us as to its actual amount, and intensity, and importance. For it was, no doubt with perfect truth, remarked by an author[2] who wrote three hundred years ago, "Mulier, in partu, maximos et fere intolerabiles sustinet dolores."

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[1] See Monthly Journal of Medical Science for September 1847, Pp. 156–166, "On the Allegation of the Prevention of Pain in Surgical Cases being Unnecessary and Improper."

[2] Introduction to Midwifery. 5th edition, p. 377.

Some living authors—without any view to such a question as the possibility of avoiding it—in fact, with a view only to the accurate painting of nature, have described to us in forcible language the degree of suffering attendant upon the last stages of the process of common parturition. "The pulse (says Dr Merriman) "gradually increases in quickness and force; the skin grows hot; the face becomes intensely red; drops of sweat stand upon the forehead; and a perspiration, sometimes profuse, breaks out all over the body; frequently violent tremblings accompany the last pain, and at the moment that the head passes into the world, the extremity of suffering seems to be beyond endurance."[3] Or, let us take the picture of the sufferings of the mother in the last part of natural labour, as portrayed by one who is universally reputed by the obstetric profession as the most faithful of living observers—Professor Naegele of Heidelberg—"The pains (he observes) of this stage are still more severe, painful, and enduring; return after a short interval, and take a far greater effect upon the patient than those of the previous stage. Their severity increases so much the more from the additional suffering arising from the continually increasing distension of the external parts. They convulse the whole frame, and have hence been called the *dolores conquassantes.* The bearing down becomes more continued, and there is not unfrequently vomiting. The patient quivers and trembles all over. Her face is flushed, and, with the rest of the body, is bathed in perspiration. Her looks are staring and wild; the features alter so much that they can scarcely be recognised. Her impatience rises to its maximum with loud crying and wailing, and frequently expressions which, even with sensible, high-principled women, border close upon insanity. Every thing denotes the violent manner in which both body and mind are affected." [1] "This (observes Dr Rigby) is the moment of greatest pain, and the patient is frequently quite wild and frantic with suffering; it approaches to a species of insanity, and shows itself in the most quiet and gentle dispositions. The laws in Germany have made great allowances for any act of violence committed during these moments of frenzy, and wisely and mercifully consider that the patient at the time was labouring under a species of temporary insanity. Even the act of child murder, when satisfactorily proved to have taken place at this moment, is treated with considerable leniency. This state of mind is sometimes manifested in a slighter degree by actions and words so contrary to the general habit and nature of the patient, as to prove that she could not have been under the proper control of her reason at the moment. It is a question how far this state of mind may arise from intense suffering, or how far the circulation of the brain may be affected by the pressure which is exerted upon the abdominal viscera." [2]

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[1] Cases undoubtedly ever and anon occur, in which the mother suffers comparatively little or no pain; but these are exceptions, rare exceptions, to a general rule.

[2] Hieronymus Mercurialis, in Spachius Gynaecia, p. 233.

[3] Synopsis of Parturition, p. 15.

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[1] Lehrbuch der Geburtshulfe. p. 104. See British and Foreign Medical Review, vol. xix. p. 64.

[2] System of Midwifery, p. 103.

Such is the description of the amount of pain and agony endured in natural parturition, given by some of our best and most esteemed authorities in obstetric literature.

Is it right for the physician to interfere with these fearful sufferings and agonies in order to save and shield his patients from the endurance of them? Is it proper for him to exercise the skill of his art so as to moderate and remove these "almost intolerable pains (*fere intolerabiles dolores?*") Would it be fit and meet in him to use human means to assuage the pangs and anguish attendant upon the process of parturition in the human mother?

These questions, and questions like these, I have often during the currency of the present year, heard complacently put by medical men,—men, too, whose opinions and actions in other matters, and in other respects, were fully and truly actuated by that great principle of emotion which both impels us to feel sympathy at the sight of suffering in any fellow creature,[1] and at the same time imparts to us delight and gratification in the exercise of any power by which we can mitigate and alleviate that suffering. Such questions, I repeat, are seriously asked by physicians and surgeons, the professed object of whose whole science and art is the relief of human disease and human suffering. They are questions propounded with all imaginable gravity and seriousness by individuals who (in a mere abstract point of view) would, no doubt, strongly object to being considered as anxious to patronize and abet human misery, or traffic in the perpetuation of human pain. Nay, probably, at the date at which I write, there is not one in twenty—perhaps not one in a hundred—of the physicians and surgeons of Great Britain who have, as yet, thought seriously upon the propriety of alleviating and annulling the tortures attendant on human parturition; or who have acknowledged to their own minds the propriety of their bestirring themselves so as to be able, in the exercise of their profession, to secure for their patients an immunity from the throes and agonies of childbirth.

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[1] "Inditus est, ab ipsa Natura, homini, *misericordiæ* affectus nobilis et excellens." Bacon—"De Augmentis Scient.," Lib. viii. cap. ii.

Perhaps, as an apology for their indolence and apathy, some may be ready to argue, that the pain and suffering attendant on parturition is not dangerous and destructive in its results, however agonizing and distressing it may be to the patient during its continuance. But the argument is fundamentally unsound. All pain is *per se*, and especially when in excess, destructive and even ultimately fatal in its action and effects. It "exhausts (says Mr Travers) the principle of life."[1] "It exhausts (says Mr Burns of Glasgow) both the system and the part."[2] "Mere pain (observed the late Dr Gooch) *can* destroy life."[3] And the great pain accompanying human parturition is no exception to this general pathological law. For, in fact, the maternal mortality attendant upon parturition, regularly increases in a ratio progressive with the increased duration of the woman's sufferings. The statistical data published by Dr Collins, in his Report of the Dublin Lying-in Hospital, affords ample proof of this general principle. According to calculations which I some time ago made from Dr Collins' data, I found that while in the women delivered in the Dublin Hospital, and whose sufferings were terminated within 2 hours, only 1 in 320 of the mothers died; where the labour varied in duration from 2 to 6 hours, 1 in 145 of the mothers died; in those in whom it continued from 7 to 12 hours, 1 in 80 died; where it endured from 12 to 24 hours, 1 in 26 died; where it lasted from 24 to 36 hours, 1 in 17 died; and out of all those whose parturient sufferings were prolonged beyond 36 hours, 1 in every 6 perished.

Again, some may possibly be inclined to reason, that any means by which we could produce a state of anæsthesia or insensibility to the physical pains of labour, must, of necessity, be of such a character as to add to the perils and dangers of the patient. I believe this argument to be as futile and untenable as the one that I have just noticed. Indeed, judging from analogy, and from what is the fact in surgery, I believe that, as a counteraction to the morbific influence of pain, the state of artificial anæsthesia does not only imply a saving of human suffering, but a saving also of human life. Out of above 300 cases of the larger amputations performed during the current year, upon patients in an etherized or anæsthetic state, and which I have collated from different hospitals in Great Britain, Ireland, and France, a smaller proportion died than formerly used to perish in the same hospitals under the same operations without etherization. I shall take one of these amputations as an illustration of the whole—and that one the most severe of all—viz. amputation of the thigh. Malgaigne (1842) showed, that under amputations of the thigh, in the hospitals of Paris, 62 in every 100 died; in Edinburgh, the mortality from this operation, in the only years during which the hospital reports were published (1839–42), was 50 in every 100; Mr Phillips of London (1844), found the average mortality 40 in 100; Dr Lawrie at Glasgow (1839), found it also in the hospitals of that city to be 40 in 100.[1] I have notes of 135 cases in which this same operation has been performed in hospital practice upon patients in an etherized state. Out of these 135 cases 33 died, or only 24 in 100. Hence I repeat, that the condition of anæsthesia not only preserves the patient in surgical practice from agony

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[1] Inquiry concerning Constitutional Irritation, vol. i. p. 76.

[2] Principles of Surgery, vol. i. p. 502.

[3] Dr Merriman's Synopsis of Parturition, p. 239.

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[1] The following table exhibits the actual number of the cases of amputation of the thigh referred to in the text, with their respective results :—

MORTALITY ACCOMPANYING AMPUTATION OF THE THIGH.

Name of Reporter.	Number of Cases.	Number of Deaths.	Per Centage of Deaths.
Malgaigne—Paris, ...	201	126	62 in 100
Peacock—Edinburgh, ...	43	21	50 in 100
Phillips' Collection of Cases, . . .	660	263	40 in 100
Lawrie—Glasgow, ...	184	73	40 in 100
Total, ...	1088	483	44 in 100
Upon Patients in an Anæsthetic state, ...	135	33	24 in 100

and torture, but actually preserves him too from the chances of danger and death. And I firmly believe, that the superinduction of anæsthesia in obstetric practice will yet be found to diminish and remove also, in some degree, the perils as well as the pains of labour.

In an essay which I wrote in February last, "On the Employment of the Inhalation of Sulphuric Ether in the Practice of Midwifery," (*Monthly Journal of Medical Science* for March 1847, p. 728), I offered some remarks on its application to cases of common as well as of morbid parturition, and took occasion to observe, "The question which I have been repeatedly asked is this—Will we ever be 'justified' in using the vapour of ether to assuage the pains of natural labour? Now, if experience betimes goes fully to prove to us the safety with which ether may, under proper precautions and management, be employed in the course of parturition, then, looking to the facts of the case, and considering the actual amount of pain usually endured, I believe that the question will require to be quite changed in its character. For, instead of determining in relation to it whether we shall be 'justified' in using this agent under the circumstances named, it will become, on the other hand, necessary to determine whether on any grounds, moral or medical, a professional man could deem himself 'justified' in withholding, and *not* using any such safe means (as we at present pre-suppose this to be), provided he had the power by it of assuaging the pangs and anguish of the last stage of natural labour, and thus counteracting what Velpeau describes as 'as those piercing cries, that agitation so lively, those excessive efforts, those inexpressible agonies, and those pains apparently intolerable,'[1] which accompany the termination of natural parturition in the human mother."

Since the latter part of January, I have employed etherization, with few and rare exceptions, in every case of labour which has been under my care. And the results, as I have already elsewhere stated, have been, indeed, most happy and gratifying. I never had the pleasure of watching over a series of more perfect or more rapid recoveries; nor have I once witnessed any disagreeable result to either mother or child. I have kept up the anæsthetic state during periods varying from a few minutes to three, four, five, and six hours. I do not remember a single patient to have taken it who has not afterwards declared her sincere gratitude for its employment, and her indubitable determination to have recourse again to similar means under similar circumstances. All who happened to have formerly entertained any dread respecting the inhalation, or its effects, have afterwards looked back, both amazed at, and amused with, their previous absurd fears and groundless terrors. Most, indeed, have subsequently set out, like zealous missionaries, to persuade other friends to avail themselves of the same measure of relief in their hour of trial and travail; and a number of my most esteemed professional brethren in Edinburgh have adopted it with success, and results equal to my own. All of us, I most sincerely believe, are called upon to employ it by every principle of true humanity, as well as by every principle of true religion.[1] Medical men may oppose for a time the superinduction of anæsthesia in parturition, but they will oppose it in vain; for certainly our patients themselves will force the use of it upon the profession. The whole question is, even now, one merely of time. It is not—Shall the practice come to be generally adopted? but, When shall it come to be generally adopted? Of course, it will meet from various quarters with all due and determinate opposition. Medical men will, no doubt, earnestly argue that their established medical opinions and medical practices should not be harshly interfered with by any violent innovations of doctrine regarding the non-necessity and non-propriety of maternal suffering. They will insist on mothers continuing to endure, in all their primitive intensity, all the agonies of childbirth, as a proper sacrifice to the conservatism of the doctrine of the desirability of pain. They will perhaps attempt to frighten their patients into the medical propriety of this sacrifice of their feelings;[1]

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[1] Traité des Accouchemens, Vol. I. p. 449. "Ces cris perçans, cette agitation si vive, ces efforts excessifs, ces angoisses inexprimables, ces douleurs qui parassaient intolerables," &c.

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[1] See "Answer to the Religious Objections urged against the employment of Anæsthetic Agents in Midwifery and Surgery."

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[1] We can all recollect the many absurd stories of apocryphal disasters and deaths that the opponents of etherization busily and anxiously reported towards the commencement of the present year, as having occurred from the employment of ether-inhalation in surgery. Dr Forbes, in his excellent article on etherization, in treating of these unscrupulous and disreputable pieces of professional gossip, observes—"One day we had death from asphyxia; another from coma; another from hemoptysis; some from convulsions; a few from pneumonia; and one or two from actual incremation, or explosion, through the accidental firing of the ethereal vapour within the air passages. We have not had time to investigate all these terrible cases; but we may state that we traced *the one* which seemed the *best* authenticated—that from hemoptysis—from its full-blown majesty in after-dinner gossip, to its humble source in the hospital. And this was the case, as the man himself detailed it to us:—A day or two after a successful operation for hernia, under etherization, the man pricked his gums while picking his teeth with a pin; and it was the product of *this* operation, not of the ether, seen in the spitting-pot by the patient's bedside, that was bruited about town, as of itself sufficient to settle the question in all future time!—(*British and Foreign Medical Review*, No. XLVI. April 1847, p. 564).—When first employing etherization in midwifery, I met with no small number of similar strange tales and accusations. For example, in February last, a patient who happened to be severely frightened had, in consequence, a premature labour. The child presented preternaturally; and died a day or two after birth. The mother was attacked with phlegmasia dolens, and made a very long and protracted recovery. Various kind friends, anxious about the results of etherization in midwifery, warned me of the professional odium which this case was bringing upon the new practice, and of the strong argument which it was affording to others against the safety of ether-inhalation in obstetrics. I was repeatedly and credibly told that ladies had informed their physicians, that the quantity used was *so* great that they had felt the odour of it perfectly oppressive when calling, even days afterwards, at the house of my patient. The answer to all this was sufficiently simple. The danger

and some may be found who will unscrupulously ascribe to the new agency any misadventures, from any causes whatever, that may happen to occur in practice. But husbands will scarcely permit the sufferings of their wives to be perpetuated merely in order that the tranquillity of this or that medical dogma be not rudely disturbed. Women themselves will betimes rebel against enduring the usual tortures and miseries of childbirth, merely to subserve the caprice of their medical attendants. And I more than doubt if any physician is really justified, on any grounds, medical or moral, in deliberately desiring and asking his patients to shriek and writhe on in their agonies for a few months—or a few years longer—in order that, by doing so, they may defer to his professional apathy, or pander to his professional prejudices.

Two agents have the power of producing anæsthesia during labour, viz. the inhalation of sulphuric ether, and the inhalation of chloroform. With most, if not all, of my professional brethren, I believe that the latter agent possesses various important advantages over the former, particularly in obstetric practice; and that, in particular, it is far more portable; more manageable and powerful; more agreeable to inhale; is less exciting than ether; and gives us far greater

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of death to the child from its prematurity and preternatural presentation appeared to be from the first so imminent, that I did not choose to peril the character of the new practice by following it in this case. The ether had not only not been used: but not a drop of it had ever been in the house.—One of my patients was zealously attempted, some months ago, to be persuaded against the "horrors of ether," on the strong and round assertion, that some dozen ladies or more in Dublin, upon whom the practice had been tried, had indubitably perished from the effects of it. Unfortunately for the veracity of this statement, ether-inhalation had never once been used, or attempted to be used in obstetric practice in Dublin, up to that date, or for a long time afterwards. Indeed, the first case in which ether was employed in midwifery in Dublin only occurred this week (28th Nov.); as I am informed in a letter of that date, which I have just received regarding it, from Dr Tyler.

control and command over the superinduction of the anæsthetic state. In the remaining part of these observations I shall detail briefly some instances illustrative of its effects and utility in the production of anæsthesia in cases of natural and morbid parturition.

Case I.—The patient to whom it was first exhibited had been previously delivered in the country by craniotomy after a very long labour. Her second confinement took place a fortnight before the full time. Chloroform was begun to be inhaled when the os uteri was becoming well expanded, and the pains very severe. In twenty-five minutes the child was born. The crying of the infant did not rouse the mother, nor did she awake till after the placenta was removed. She was then perfectly unaware that her child was born. She stated her sensations to be those of awaking from "a very comfortable sleep." It was, for a time, a matter of no small difficulty to persuade her that the labour was over, and that the living child presented to her was her own.

Case II.—I exhibited it, with Mr Carmichael, to a patient who had, at her preceding confinement, been in severe labour for twenty hours—followed by flooding. She began the inhalation when the dilatation of the os uteri was half completed. The child was born in fifty minutes afterwards. She was kept under its influence for a quarter of an hour longer, till the placenta was removed, and the binder, body, and bed-clothes, all adjusted. On awaking, she declared she had been sleeping refreshingly; and was quite unconscious that the child was born, till she suddenly heard it squalling at its first toilet in the next room. No flooding. An hour afterwards, she declared she felt perfectly unfatigued, and not as if she had borne a child at all.

Case III.—Patient unmarried. A first labour. Twins. The first child presented by the pelvis, the second with the hand and head. The chloroform was exhibited when the os uteri was nearly fully dilated. The passages speedily became greatly relaxed (as has happened in other cases placed under its full influence); and in a few pains the first child was born, assisted by some traction. I broke the membranes of the second, pushed up the hand, and secured the more complete presentation of the head. Three pains expelled the child. The mother was then bound up; her clothes were changed; and she was lifted into another bed. During all this time she slept on soundly, and for a full hour afterwards; the chloroform acting in this, as in other cases of its prolonged employment, as a soporific. The patient recollected nothing from the time of the first inhalations; and was in no small degree distressed when not one—but two—living children were brought by the nurse to her. Dr Christison accompanied me to this case.

Case IV.—Primipara of full habit. When the first examination was made, the passages were rigid, and the os uteri difficult to reach. Between six and seven hours after labour began, the patient, who was complaining much, was apathized with the chloroform. In about two hours afterwards, the os uteri was fully dilated, and in four hours and a half after the inhalation was begun, a large child was expelled. The placenta was removed, and the patient bound up and dressed before she was allowed to awake. This patient required an unusual quantity of chloroform; and Dr Williamson, who remained beside her, states to me in his notes of the case, "the handkerchief was moistened often in order to keep up the soporific effect. On one occasion, I allowed her to emerge from this state for a short time; but on the accession of the first pain she called out so for the chloroform, that it was necessary to pacify her by giving her some immediately. In all, four ounces of chloroform were used." Like the others, she was quite unconscious of what had gone on during her anæsthetic state; and awoke altogether unaware that her child was born.

Case V.—Second labour. This patient, after being several hours in labour, was brought to the Maternity Hospital. I saw her some time afterwards, and found the first stage protracted by the right side of the cervix uteri being thick, œdematous, and undilatable. The inhalation of chloroform was begun, and the first stage was terminated in about a couple of hours. Two or three pains drove the child through the pelvic canal, and completed the second stage. Fifteen minutes in all elapsed from the termination of the first to the termination of the third stage, or the expulsion of the placenta. The patient was dressed and removed into a dry bed, where she slept on for a short time before awaking, and being conscious of her delivery.

Case VI.—Second labour. The patient, a person of small form and delicate constitution; bore her first child prematurely at the seventh month. After being six hours in labour, the os uteri was fully expanded, and the head well down in the pelvic cavity. For two hours subsequently, it remained fixed in nearly the same position, and scarcely if at all advanced, although the pains were very distressing, and the patient becoming faint and exhausted. She entertained some mistaken religious feelings against ether or chloroform, which had made her object to the earlier use of the latter; but I now placed her under its influence. She lay as usual like a person soundly asleep under it, and I was now able, without any suffering on her part, to increase the intensity and force of each recurring pain, by exciting the uterus and abdominal muscles through pressure on the lower part of the vagina and perineum. The child was expelled in about fifteen minutes after the inhalation was commenced. In a few minutes she awoke to ask if it was really possible that her child had been born; and was overjoyed to be told that it was so. I had the conviction that in this case the forceps would in all probability have been ultimately required, perhaps hours subsequently, provided I had not been able to have interfered in the way mentioned. I might, it is true, have followed the same proceeding though the patient was not in an anæsthetic state, but I could not have done so without inflicting great misery and agony upon her, and meeting with great resistance.

Case VII.—A third labour. The patient had been twice before confined of dead premature children; once of twins, under the care of Mr Stone of London; the second time of a single child, under my own charge. The liquor amnii began to escape about one o'clock A.M., but no pains followed for some time. I saw her between three and four, with the pains commencing, and the os uteri beginning to dilate. In two hours afterwards the first stage was well advanced, and, the pains becoming severe, she had the chloroform exhibited to her, and slept soundly under its influence. In twenty minutes the child was born, and cried very loudly without rousing the mother. In about twelve or fifteen minutes more she awoke, as the application of the binder was going on, and immediately demanded if her child was really born and alive, as she thought she had some recollection of hearing the nurse say so. She was rejoiced beyond measure on her son being brought in and presented to her.

CASE VIII.—Fourth labour. The patient had born three dead children prematurely, about the sixth and seventh months of utero-gestation. During her present pregnancy I placed her under strict rules and discipline; and she used, from an early period, small doses of chlorate of potass several times a-day. She carried her child to the full time. Labour came on about one o'clock A.M. The membranes broke at eight A.M., when the os uteri was still very slightly open. It had made very little progress till ten o'clock, when Dr Keith exhibited the chloroform to her. The pains continued very strong and regular, the passages relaxed, and at half-past eleven she was delivered of a large living child. The placenta came away immediately; and she was bound up, and her soiled clothes removed, before she awoke. She remembered nothing whatever that had occurred after she began to inhale the chloroform till the period of her awaking.

The preceding instances afford, perhaps, a sufficient number of examples of the use of chloroform in natural labour. In these and in all others which I have seen, or that have been reported to me, the immediate effects of the chloroform have been delightful. The mothers, instead of crying and suffering under the strong agonies and throes of labour, have lain in a state of quiet, placid slumber, made more or less deep at the will of the medical attendant, and, if disturbed at all, disturbed only unconsciously from time to time by the recurring uterine contractions producing some reflex or automatic movements on the part of the patient—like those of a person moving under any irritation of the surface, or from the touch of another, though still in a state of sleep. Nor have the ultimate consequences and results been less happy. No difficulties have been met with in the third stage; and the uterus has contracted perfectly after delivery. I never saw mothers recover more satisfactorily or rapidly,—or children that looked more viable. And the practice is not a great blessing to the patient merely; it is a great boon also to the practitioner. For whilst it relieves the former from the dread and endurance of agony and pain, it both relieves the latter from the disagreeable necessity of witnessing such agony and pain in a fellow-creature, and imparts to him the proud power of being able to cancel and remove pangs and torture that would otherwise be inevitable. It transforms a work of physical anguish into one of painless muscular effort; and changes into a scene of sleep and comparative repose, that anxious hour of female existence, which has ever been proverbially cited as the hour of the greatest of mortal suffering.

The effects of the superinduction of anæsthesia in parturition are, if possible, still more marked and beneficial in cases of morbid labour and operative delivery. In proof of its influence in this respect, I shall cite some examples of its employment in cases of turning, of the application of the forceps, and of embryulsio.

Case IX.—Fourth labour. The mother deformed, and the conjugate diameter of the brim of the pelvis contracted from the projection inwards and forwards of the promontory of the sacrum. Her first child was delivered by embryulsio; the second by the long forceps; the third was small, and passed without artificial assistance. On the present occasion, after suffering slight pains during the whole night, labour set in with greater severity towards morning. After being in strong labour for some hours, she was seen first by Mr Figg, and afterwards by Dr Peddie, her ordinary medical attendant. I was called to her about four o'clock P.M. The pains were then enormously powerful and straining, imparting to the mind the dread of the uterus rupturing under their influence; but the head of the child was still altogether above the brim, and only an œdematous ridge of the scalp pressed through the superior and contracted pelvic opening. The passages had become heated, the mother's pulse raised, &c., and Dr Peddie had tried two different pairs of long forceps. After I arrived he applied, with great skill, another pair of long forceps which I had with me; but it was found impossible to move the head in the least degree forwards. The urgency and power of the uterine contractions, the immobility of the head upon the brim of a deformed pelvis, and the state of the patient and of the parts, all showed the necessity of relief being obtained by artificial delivery. In her first labour I had assisted Dr Peddie in delivering her under similar circumstances by perforation of the head. But here the child's heart was heard distinctly with the stethescope, and he at once agreed to my proposition, that I should try to deliver her by turning the infant,—compressing and indenting the flexible skull of the fœtus, instead of perforating it, and thus affording (as I have for some time past taught and believed) some chance of life to the child, and more chance of safety to the mother. The patient was placed under the influence of chloroform still more deeply than when the forceps were used, in order, if possible, entirely to arrest the uterine contractions. I passed up my hand into the uterus, seized a knee, and easily turned the infant; but very great exertion and pulling was required to extract the child's head through the distorted brim. At last it passed, much compressed and elongated. The child was still-born, but, by applying the usual restorative means, it speedily began to breathe and cry. The child continues well, and the mother has made a rapid recovery.

Case X.—In the Maternity Hospital; first child. Labour began at ten P.M. (21st Nov.) I was desired to see her at six A.M. (22d). The os uteri was well dilated, but it was evident that the pelvic canal was contracted throughout, and the head was passing with unusual difficulty through the brim. The patient was complaining much of her sufferings. It was clear that it would be a very tedious and probably at last an instrumental case, and one therefore calculated to test the length of time during which chloroform might be used. She began to inhale it at a quarter past six A.M., and was kept under its influence till a quarter past seven P.M., the date of her delivery; thirteen hours in all. From the time it was begun to the time delivery was completed, her cries and complaints ceased, and she slept soundly on throughout the day. The bladder required to be emptied several times with the catheter. The head passed the os uteri at ten A.M.; and, during the day, gradually descended through the pelvis. At seven A.M. I at last deemed it proper to deliver her by the forceps; the head, which was now elongated and œdematous, having by that time rested for some hours against the contracted pelvic outlet with little or no evidence of advancement, the bones of the fœtal cranium overlapping each other, and the fœtal heart becoming less strong and distinct in its pulsations. A warm bath, irritation of the chest, &c., were necessary to excite full and perfect respiration in the infant. Whilst we were all busied with the infant the mother lost some blood; but the placenta was immediately removed, and the uterus contracted perfectly. On afterwards measuring the quantity of blood lost, it was calculated to amount to 15 or 18 ounces. The mother's clothes were changed; she was bound up and removed to a dry bed before she awoke. She had at first no idea that the child was born, and was in no respect conscious of being delivered. In fact she had been "sleeping," according to her own account, from the time she had begun the inhalation, and only thought she once or twice remembered or dreamed that she heard Dr Williamson, the house surgeon, speak near her. Dr Beilby, Dr Zeigler, &c., saw the case with me. The mother and child have continued perfectly well.

In this, as in other cases, I have watched and noted the effects of the chloroform upon the duration of the pains and of the intervals, the rate of the fœtal and maternal pulse, &c.

Case XI.—Patient with a deformed spine and contracted pelvic outlet. At her first confinement two different medical gentlemen had failed in effecting delivery by the forceps. At this her second confinement, she placed herself under the care of Dr Paterson of Leith. After being very long in labour, and the symptoms of the case becoming urgent, I saw her with Dr Paterson. The head was low down in the pelvis; but it was placed in the right occipito-posterior position (the third of Naegele), and the forehead instead of the vertex was presenting, one orbit being easily felt behind the symphysis pubis. It had been lodged in nearly the same position for many hours. The fœtal heart was still distinct, but weak. I applied the forceps—turned the head round with them a quarter of a circle, into an occipito-anterior position (the second of Naegele); and, after being so adjusted, it still required considerable force to extract it. Before applying the forceps the patient was sent into a state of deep anæsthesia by the inhalation of chloroform; and subsequently, when she wakened out of it, she was in no small degree surprised to find that she had really been delivered while she was sleeping and resting so soundly. The placenta separated, and the uterus contracted firmly. The child, which was large, lived for eight hours after delivery; but, despite of all the measures tried, full and perfect respiration was never established in it, apparently in consequence of some effusion or injury about the base of the brain. Unfortunately a post-mortem examination was not obtained. The mother has made an excellent recovery.

I quote the following instance of craniotomy under chloroform from a letter (dated 29th November), which I have received from my friend, Professor Murphy of London. I give the case in Dr Murphy's own words :—

Case XII.—"I have tried the chloroform with great success in a case of distorted pelvis. It was the ovate deformity, the conjugate measurement being only 2½ inches ; the head of the child could not enter the brim: and I was obliged to perforate. I got Dr Snow to assist me in bringing her under the influence of chloroform. She made some resistance, and struggled a good deal at first, chiefly I think from apprehension that we were going to do something very dreadful; however she soon began to inhale quietly, and gradually fell into a kind of dreamy sleep. I perforated the head, and laboured with the crochet (sometimes with the craniotomy forceps) for three quarters of an hour before I could get the head through the brim. She was at length delivered; the placenta was separated in about ten minutes; the bandage applied, soiled clothes removed, and she was made 'clean and comfortable,' as the midwives say. My patient was perfectly unconscious all this time, and did not awake for about a quarter of an hour after the operation ; she did so then quite quietly, and was greatly surprised to find that all her miseries were over. There was no hemorrhage, but the uterus felt rather spongy and large. She is now recovering most favourably. I never had a case recover so far, so well."

Other cases, both of natural and morbid labour, in which the patients were delivered in an anæsthetic state from the inhalation of chloroform, have been reported to me by Dr Protheroe Smith, Dr Imlach, Dr Robertson of Birkenhead, Dr Malcolm, Dr Buchanan, &c. ; but as these, and some other instances which I have myself seen, presented nothing new or different in their phenomena from the cases which I have already detailed, I have thought it unnecessary to overload the present communication by the details of them.

THE END.

ANSWER

TO

THE RELIGIOUS OBJECTIONS

ADVANCED AGAINST

THE EMPLOYMENT OF ANÆSTHETIC AGENTS IN MIDWIFERY AND SURGERY.

BY

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> " For every creature of God is good, and nothing to be refused, if it be received with thanksgiving."—1st Timothy iv. 4.

> "Therefore to him that knoweth to do good and doeth it not, to him it is Sin."—James iv. 17.

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RELIGIOUS OBJECTIONS TO THE EMPLOYMENT OF ANÆSTHESIA.

ALONG with many of my professional brethren in Scotland, and perhaps elsewhere, I have, during the last few months, often heard patients and others strongly object to the superinduction of anæsthesia in labour, by the inhalation of Ether or Chloroform, on the assumed ground, that an immunity from pain during parturition was contrary to religion and the express commands of Scripture. Not a few medical men have, I know, joined in this same objection;* and have refused to relieve their patients from the agonies of childbirth, on the allegation that they believed that their employment of suitable anæsthetic means for such a purpose would be unscriptural and irreligious. And I am informed that, in another medical school, my conduct in introducing and advocating the superinduction of anæsthesia in labour has been publicly denounced *ex cathedra* as an attempt to contravene the arrangements and decrees of Providence, hence reprehensible and heretical in its character, and anxiously to be avoided and eschewed by all properly principled students and practitioners. I have been favoured with various earnest private communications to the same effect, Probably, therefore, I may be excused if I attempt, however imperfectly, to point out what I conscientiously conceive to be the errors and fallacies of those who thus believe that the practice in question ought in any degree to be opposed and rejected on religious grounds.

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* "Pain during operations is, in the majority of cases, even desirable; its prevention or annihilation is, for the most part, hazardous to the patient. In the lying-in chamber, nothing is more true than this; pain is the mother's safety, its absence her destruction. Yet, there are those bold enough to administer the vapour of Ether, even at this critical juncture, forgetting it has been *ordered*, that 'in sorrow shall she bring forth.'"—(*On the "Injurious* (?) *Effects of the Inhalation of Ether;" in Edinburgh Medical and Surgical Journal for July* 1847, p. 258.)

It is almost unnecessary to begin with premising, that those who object to the superinduction of anæsthesia in parturition upon religious grounds, found their objections principally on the words of the primeval curse which God pronounced after the temptation and fall of our first parents. Few or none, however, of those who have most zealously urged the existence of this curse as a reason against the employment of anæsthetic means in obstetric practice, have, I believe, made themselves at all intimate with the words and tenor of the curse itself. I shall, therefore, in the first place, quote the words of it in full from the third chapter of Genesis, interpolating in Roman letters the Hebrew originals of those two nouns which are the more immediate subjects of doubt and difference of opinion.

Genesis, chap. iii. v. 14.—"And the Lord God said unto the serpent, Because thou hast done this, thou art cursed above all cattle, and above every beast of the field; upon thy belly shalt thou go, and dust shalt thou eat all the days of thy life.

15. "And I will put enmity between thee and the woman, and between thy seed and her seed; it shall bruise thy head, and thou shalt bruise his heel.

16. "Unto the woman he said, I will greatly multiply thy sorrow (*'itztzabhon)* and thy conception; in sorrow (*'etzebh*) thou shalt bring forth children; and thy desire shall be to thy husband, and he shall rule over thee.

17. "And unto Adam he said, Because thou hast hearkened unto the voice of thy wife, and hast eaten of the tree, of which I commanded thee, saying, Thou shalt not eat of it; cursed is the ground for thy sake: in sorrow (*'itztzábhón*) shalt thou eat of it all the days of thy life:

18. "Thorns also and thistles shall it bring forth to thee; and thou shalt eat the herb of the field.

19. "In the sweat of thy face shalt thou eat bread, till thou return unto the ground; for out of it wast thou taken: for dust thou art, and unto dust shalt thou return.

In the form of a few separate observations, I will now add the remarks and answers which I wish to make. And I would begin by observing, that,—

1. The primeval curse is triple. It contains a judgment, First, upon the serpent (verses 14, 15); Secondly, upon the woman (v. 16); and, Thirdly, upon the ground for the sake of the man (v. 17-19).—With the first of these three curses—that on the serpent—and its apparent permanence (Isaiah lxv. 25,), our present inquiry has nothing to do. It is enough for me to remark, that the second and third curses—on the woman and on the ground—are evidently, from different parts of the Holy Word, not immutable. God himself, on more than one occasion, promises the removal of them, and in general conjunctly, to the Israelites, provided they would keep their covenants and obey his laws. See, for example, Deuteronomy vii. 13, "I will bless the fruit of thy womb, and the fruit of thy land," &c.; xxviii. 4, "Blessed shall be the fruit of thy body, and the fruit of thy ground," &c. See also Chap. xxviii. 11, &c. In Isaiah (xxviii. 23-29), man's culture by the plough, &c., of the ground cursed by God, is said to come from the providence of God himself. "For his God doth instruct him to discretion, and doth teach him," (v. 26); and, "This also cometh forth from the

Lord of hosts, which is wonderful in counsel and excellent in working" (v. 29).

2. Those who, from the terms of the first curse, argue against the superinduction of anæsthesia in labour, aver that we are bound to take and act upon the words of the curse *literally*, "I will greatly multiply thy sorrow and thy conception;" or as Gesenius and other Hebrew authorities state, that, being a case of Hendiadys, it may be *more* correctly rendered, "I will greatly multiply the sorrow *of* thy conception;* in sorrow thou shalt bring forth children." If, however, we are bound to take *this* part of the curse literally, and act accordingly, then we are bound to take and act also upon *all* other parts of the curse literally. If it is sinful to try to counteract the effects of this part of it, referring to child-bearing women, it is sinful to try to counteract the other parts of it, regarding the state of the ground, and the judgment upon man. The agriculturist, in pulling up "the thorns and thistles" which the earth was doomed to bear, so far tries to counteract that part of the primary doom; and yet is never looked upon as erring and sinning in doing so. Or grant, as I have heard argued, that he may be entitled to pull up "the thorns and thistles," because the curse further implies that he was doomed to till the ground,—still he was doomed to till it by "the sweat of his face." Now if, I repeat, the whole curse is, as is averred, to be understood and acted on literally, then man must be equally erring and sinning, when, as now, instead of his own sweat and personal exertions, he employs the horse and the ox—water and steam power—sowing, reaping, thrashing, and grinding machines, &c., to do

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* "Augebo tibi *Graviditatis* molestias."—Dathe's Pentateuchus, p. 38.

this work for him, and elaborate the "bread" which he eats. The ever active intellect which God has bestowed upon man, has urged him on to the discovery of these and similar inventions. But if the first curse must be read and acted on literally, it has so far urged him on to these improper acts by which he thus saves himself from the effects of that curse. Nay, more; if some physicians hold that they feel conscientiously constrained not to relieve the agonies of a woman in childbirth, because it was ordained that she should bring forth in sorrow, then they ought to feel conscientiously constrained on the very same grounds not to use their professional skill and art to prevent man from dying; for at the same time it was decreed, by the same authority and with the same force, that man should be subject to death,—"dust thou art, and unto dust shalt thou return." If, on the other hand, it be allowed that it is justifiable in the physician to try to counteract the effects of one part of the curse, and justifiable in the agriculturist to try to counteract the effects of another part, it is surely equally justifiable in the accoucheur to try to counteract the effects of a third part of it. But if, on the contrary, it is unjustifiable for him to follow out this object of his profession, it is equally unjustifiable for the physician and agriculturist to follow out the corresponding objects of their professions. Are those who maintain the uncanonical character of using human means to contravene the pains of childbirth ready, then, to maintain that we should not use human means to contravene the tendency to death, or to increase the fertility and produce of the ground except by personal labour, and the actual "sweat" of the brow? To be consistent, they must of necessity maintain this strange and irrational view of man, and of the duties and destinies which God has appointed for man. Or, otherwise, they must own that if it is right and meet in us to exert the human intellect so as to ameliorate the condition of man from the results of the fall, it is equally right and meet in us to employ the same means to ameliorate the condition of woman from the results of the same cause.

3. But does the word sorrow ("in sorrow thou shalt bring forth children") really mean physical and bodily *pain*, as is taken for granted by those who maintain the improper and irreligious character of any means used to assuage and annul the sufferings of childbirth? Now, the word "sorrow" occurs three several times in two consecutive verses of the curse; (verses 16 and 17). The corresponding word, or rather words, in the original Hebrew, as I have already shown when citing the terms of the curse, are *'etzebh*, and *'itztzabhon*. These nouns are both synonymous in meaning and origin, although longer and shorter in form (like labour, laboriousness—pain, painfulness—in our own language). All philologists agree that they are derived from the same root, viz., the verb *'atzabh*. The true and primitive meaning of a derivative word in the Hebrew, as in other languages, is generally the best attained by considering the signification of the root from which it is derived. The meaning of the verb *'atzabh* (the root of these nouns) is given as follows, by Professor Gesenius, the highest authority, I believe, I could quote on such a point. In his Lexicon he enters "*'atzabh*, 1. To *labour*, to *form*, to *fashion*. The original idea (says he) is perhaps that of cutting, whether wood or stones. 2. To *toil with pain*, to *suffer*, to be *grieved*; used also of the mind" (Tregelles' Translation of Gesenius' Hebrew and Chaldee Lexicon, p. DCXLVI) Of the disputed nouns, the noun *'etzebh* ("in sorrow—*'etzebh*—

thou shalt bring forth children") is nearest in form, and hence in meaning to the original verb-root *'atzabh*—and, I believe, no scholar would deem it erroneous to affix to it the same simple original signification "*labour*," "*toil*," without deeming it requisite to believe, that it at all farther necessarily imports that the implied labour and effort must essentially be to such an excess as actually to amount to the supervention of pain and agony. In fact, the Hebrew word for *labour* (in the sense of work or toil) is exactly like the English word *labour*, used also to import the act of parturition. Certainly, the greatest characteristic of human parturition as compared with parturition in the lower animals, is the enormous amount of muscular action and effort (labour) provided for, and usually required for its consummation. The erect position (*vultus ad sidera erectus*) of the human body, renders a series of peculiar mechanical arrangements and obstructions necessary in the human pelvis, &c., for the prevention of abortion and premature labour, and for the well-being of the mother during pregnancy. But these same mechanical adaptations and arrangements (such as the angle at which the pelvis is set to the spine,—the great difference in the axis of the pelvic brim, cavity, and outlet,—the rigidity of the soft structures, &c.) all render also, at last, the ultimate expulsion of the infant in labour, a far more difficult, and more prolonged process than in the quadruped, for instance, with its horizontal body. To overcome these greater mechanical obstacles, the human mother is provided with a uterus immensely more muscular and energetic than that of any of the lower animals. The uterus of woman is many times stronger and more powerful than the uterus, for example, of the cow. In other words, I repeat, the great characteristic of human parturition is the vastly greater amount of muscular effort, toil, or labour required for its accomplishment.* The state of anæsthesia does not withdraw or abolish that muscular effort, toil, or labour; for if so, it would then stop, and arrest entirely the act of parturition itself. But it removes the physical pain and agony otherwise attendant on these muscular contractions and efforts. It leaves the labour itself (*'atzebh*) entire. And in relation to the idea, that the Hebrew noun in the text truly signifies muscular *toil* and effort, and not physical *pain* and maternal agony, it is further highly important to remark, that in the very next verse (verse 17), viz. in the first part of the curse on man, the analogous Hebrew noun (*'itztzabhon*), which we translate by "sorrow," assuredly does *not* in any degree mean or imply mortal suffering or pain, but toil and labour. "In sorrow thou shalt eat of it (the ground) all the days of thy life." Indeed, the very same noun (*'itztzabhon*), when it occurs with the same meaning, and in relation to the same curse two chapters onwards —Genesis v. 29—is, in our own version, rendered by the word "toil," and not "sorrow." "And he called his name Noah (rest or comfort), saying, This same shall comfort us concerning our work or toil (*'itztzabhon*) of our hands, because of the ground which our Lord hath cursed."

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* In some of the black tribes of the human race the muscular efforts and exertions of the uterus seem to be accompanied with comparatively little or no physical pain—there is labour *without* suffering. But the black woman was cursed as well as the white; and surely it cannot be irreligious to *reduce* the sufferings of the civilized female to the degree and amount which nature has left them existing in the uncivilized female of our race. There are abundance of "maternal sorrows" connected with children and child-bearing in the civilized woman, quite independently of the actual agonies of parturition. My friend Dr Churchill of Dublin, some years ago, published a large octavo volume on the affections *peculiar* to the pregnant and puerperal states, without at all including those observable *during* labour.

The word "sorrow" is a term at once simple and striking, but, at the same time, very comprehensive in its signification; and used under various specific meanings in our authorized English version of the Bible. In the Old Testament above twenty different terms or nouns in the original Hebrew text, are translated by the single term or noun "sorrow" in the English text.* And perhaps it may not be considered irrelevant, if I remark, that the identical Hebrew noun *'etzebh*, translated "sorrows" in the 16th verse ("in sorrow—*'etzebh*—thou shalt bring forth children"), recurs in six, and I believe only in six, other passages in the Old Testament; and in not one of these does it certainly imply physical pain. In two of these six places it is rendered, in our English version, by the very word "labour," in the signification of toil or work,—viz. in Prov. xiv. 23, "In all labour (*'etzebh*) there is profit;" and Prov. v. 10, "Lest thy labours† (*'etzebh*) be in the house of a stranger." In one passage it is translated "anger,"‡ Prov. xv. 1, "Grievous words stir up anger (*'etzebh*)." In another passage in which it occurs, in Prov. x. 22, it is rendered sorrow, but still in the sense of toil and work—"The blessing of the Lord, it maketh rich, and he addeth no sorrow (*'etzebh*)|| with it." In Psalms cxxvii. 2, it is also, in our English version, translated

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* See a list of these various Hebrew words which the translators of the English Bible have rendered by the word "sorrow," in "The Englishman's Hebrew and Chaldee Concordance of the Old Testament," p. 1639.

† "Labours," *i. e.* "things done with toil"—*Gesenius.*

‡ "A word pronounced with anger—a bitter, sharp word."—*Gesenius.*

|| That is, no "heavy and toilsome labour."—*Gesenius.*

"sorrows"—"It is in vain for you to rise up early, and sit up late, to eat the bread of sorrows' (*'atzabhim*, the plural of *'etzebh*)."* And, lastly, in Jeremiah xxii. 28, the same noun is translated "idol" (a thing made, worked, or fashioned), "Is this man Coriah a despised, broken idol (*'etzebh*)?"

The context, I repeat, in these six Biblical passages in which the noun *'etzebh* recurs, shows that in *them* the word is not, in any respect, employed to designate the *sensation* of pain which accompanies the act of parturition in the human female. And it is surely not an unfair, or illegitimate deduction, to infer that in the only *one* remaining, or seventh instance in which the word occurs in the Bible—viz. in Genesis iii. 16—it would be used in the sense in which it is generally elsewhere used—of effort, toil, or labour—and not in a new sense, in which it is nowhere else used—of the *feeling* or perception of excruciating suffering, or bodily anguish.

4. But that the preceding deduction is sound and just, admits of additional, and still stronger corroborative evidence. In various passages in the Bible, the proverbial agony and pain of a woman in travail is brought in—and particularly in the inspired language of the Prophets—as a striking and beautiful simile, to mark the greatest possible degree of anguish and suffering. In not one of these passages, in which the pure pain and super-sensitive suffering of the parturient mother are thus referred to, is the word in Genesis iii. 16, viz. —the word *'etzebh*—employed to designate this feeling of pain and suffering. Two other and totally different Hebrew nouns are used for this purpose in the pas-

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* "Bread obtained by toilsome labours."—*Gesenius.*

sages to which I allude. These two nouns are *hhil* and *hhebhel.* They mark and designate the sensations of agony accompanying parturition, as contradistinguished from the muscular efforts (or labour) (*'etzebh*) in which the physiological part of the process of the expulsion of the child essentially consists. To illustrate the particular signification thus attached to the words *hhil* and *hhebhel,* as contradistinguished from *'etzebh*, I will cite the passages in which the two former nouns are used. In the following instances, the noun *hhil* is translated "pain," "pangs," &c.:—Psalm xlviii. 6, "Fear took hold upon them there, and pain as of a woman in travail." Jeremiah vi. 24, "Anguish hath taken hold of us, and pain as of a woman in travail." Jeremiah xxii. 23, "When pangs come upon thee, the pain as of a woman in travail." See, also, Jeremiah l. 43. Micah iv. 9, "Now why dost thou cry out aloud? is there no king in thee? is thy counsellor perished? for pangs have taken thee as a woman in travail." In the following instances, the noun *hhebhel* occurs in the original Hebrew with the same meaning attached to it:—Isaiah xiii. 8, "Pangs and sorrows shall take hold of them; they shall be in pain as a woman that travaileth." Isaiah xxvi. 17, "Like as a woman with child, that draweth near the time of her delivery, is in pain and crieth out in her pangs." See, also, Isaiah lxvi. 7; Jeremiah xiii. 21, and xlix. 23. Hosea xiii. 13, "The sorrows of a travailing woman shall come upon thee."

From what I have stated under the two preceding heads, we are then, I believe, justly entitled to infer that the Hebrew term which, in our English translation of the primaeval curse, is rendered "sorrow" (Genesis iii. 16), principally signifies the severe muscular *efforts* and *struggles* of which parturition—and more particularly human parturition—essentially consists; and does not specially signify the *feelings* or *sensations* of pain to which these muscular efforts or contractions give rise.—And, 2. On the other hand, the *feelings* or *sensations* of excruciating pain accompanying the process of parturition, are designated throughout the Bible by two Hebrew words which are entirely and essentially different from that term which is translated "sorrow," the oft repeated expression—"in sorrow thou shalt bring forth children."

5. But even if—contrary to what, I think, the whole philological consideration of the very terms and words of the Bible shows to be the case—we were to admit that woman was, as the results of the primal curse, adjudged to the miseries of pure physical pain and agony in parturition, still, certainly under the Christian dispensation, the moral *necessity* of undergoing such anguish has ceased and terminated. Those who believe otherwise, must believe, in contradiction to the whole spirit and whole testimony of revealed truth, that the death and sacrifice of Christ was not, as it is every where declared to be, an all-sufficient sacrifice for all the sins and crimes of man. Christ, the "man of sorrows," who "hath given himself up for us an offering and a sacrifice to God," "surely hath borne our griefs and carried our sorrows;" for God "saw the travail of his soul, and was satisfied." And He himself told and impressed on his disciples, that His mission was to introduce "mercy, and not sacrifice."—(See Matthew ix. 13; xii. 7; also Hos. vi 6). At the end of his commentary upon the curse in the third chapter of Genesis, the sound and excellent Matthew Henry, in his own quaint, pithy, and zealous style, justly observes, "How admirably the satisfaction our Lord Jesus Christ made by His

death and sufferings, answered the sentence here passed upon our first parents. 1. Did *travailing pains* come in with sin? We read of the 'travail of Christ's soul;' Isa. liii. 11; and the pains of death he was held by, are called *ωδιναι*, Acts ii. 24,—the 'pains of a woman in travail.' 2. Did *subjection* come in with sin? Christ was 'made under the law;' Gal. iv. 4. 3. Did the *curse* come in with sin? Christ was made 'a curse for us;' died a 'cursed death;' Gal. iii. 13. 4. Did *thorns* come in with sin? He was crowned with 'thorns' for us. 5. Did *sweat* come in with sin? He sweat for us, 'as it had been great drops of blood.' 6. Did *sorrow* come in with sin? He was 'a man of sorrows;' his soul was in his agony 'exceeding sorrowful.' 7. Did *death* come in with sin? He became 'obedient unto death.' Thus is the plaister as wide as the wound. Blessed be God for Jesus Christ."—(*Exposition of the Books of Moses*, p. 19.)

6. It may not be out of place to remind those who oppose the employment of anæsthetic means in labour on supposed religious grounds, that on the very same grounds many discoveries in science and art—even in the medical art—have been opposed upon their first proposition; and yet, *now* that their first introduction is over, and the opinions and practices they inculcate are established, no one would be deemed exactly rational who would turn against the present or future *continuance* of their employment any such improper weapon. I might adduce many instances, but one may suffice for all. When small-pox inoculation was introduced towards the commencement of the last century, the Rev. Mr Delafaye and Mr Massey published sermons against the practice as indefensible, on re-

ligious as well as medical grounds.* Inoculation was declared a "diabolical operation," and a discovery sent into the world by the Powers of Evil. And, again, when Dr Jenner introduced vaccination instead of small-pox inoculation, towards the commencement of the present century, theological reasons again were not wanting for calling in question the orthodoxy of this other new practice. "Small-pox (argued Dr Rowley) is a visitation from God, and originates in man, but the cow-pox is produced by presumptuous, impious man. The former, heaven ordained; the latter is perhaps a daring and profane violation of our holy religion." And he subsequently proposed, "whether vaccination be agreeable to the will and ordinances of God, as a question worthy of the consideration of the contemplative and learned ministers of the gospel of Jesus Christ; and whether it be impious and profane, thus to wrest out of the hands of the Almighty the divine dispensation of Providence!"† "The projects of these vaccinators seem (it was affirmed) to bid bold defiance to

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[*] See Delafaye's Sermon on "Inoculation; an Indefensible Practice." Massey's "Sermon against the Dangerous and Sinful Practice of Inoculation." In his admirable "Account of the Inoculation of Small-pox in Scotland (1765)," Dr Monro (*primus*) states "the first and most general prejudice against inoculation is its being deemed a tempting of God's providence, and therefore a heinous crime."—P. 5. "Clergymen (observes Dr Baron, in his Life of Jenner, vol. i. p. 231) preached from their pulpits in this style of argument, if so it might be called. Some went so far as to pronounce inoculation an invention of Satan himself, and its abettors were charged with sorcery and atheism. These things (he adds) would scarcely obtain credence were it not that similar arguments and assertions have been employed against Vaccination itself."

[†] Blair's Vaccine Contest, p. 84.

heaven itself, even to the will of God." [*] "Providence (reasoned another author) never intended that the vaccine disease should affect the human race, else *why* had it not, before this time, visited the inhabitants of the globe. The law of God (he continues) prohibits the practice; the law of man and the law of nature loudly exclaim against it." [†]

Such historical facts and efforts, and the results in which they have invariably terminated, are surely sufficient to make men cautious and hesitating against always recklessly calling up again the same religious, or supposed religious, arguments under the same circumstances. [‡] Views and arguments of this description against every new practice intended to increase the well-being and happiness of mankind, certainly are greatly more calculated to inflict damage than benefit upon the interests of true religion.

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[*] Rowley on "Cow-pock Inoculation; with the Modes of treating the Beastly new Diseases produced by it," p. 9.

[†] Dr Squirrell's Preface to the Second edition of his "Observations on Cow-pox, and the dreadful consequences of this new Disease," p. iv.

[‡] Perhaps, in the history of misplaced religious arguments against all novel opinions and practices, none in the retrospect may appear stranger than one that has been repeatedly mentioned to me during the few past months. Formerly, among my countrymen, most agricultural operations were performed, as commanded in the primeval curse, by personal exertion, and the "sweat of the face." Corn, in this way, was winnowed from the chaff by tossing it repeatedly up into the air, upon broad shovels, in order that any accidental currents which were present might carry off the lighter part. At last, however, about a century ago, "fanners," or machinery made for the production of *artificial* currents to effect the same purpose, were invented and introduced into different parts of the country. Some of the more rigid sects of Dissenters loudly declaimed against the employment of any such machinery. "Winds (they argued) were raised by God alone, and it was irreligious in man to attempt to raise wind for the aforesaid purpose for himself, and by efforts of his own." Mr Gilfillan, the well-known Scottish poet, has furnished me with evidence of one clergyman debarring from the communion of the Lord's Supper those members of his flock who thus irreverently used the "Devil's wind" (as it was termed). And such sen-

Probably I may here be excused adding, that my friend Professor Miller informs me, that when reluctantly consenting to write the elaborate article on Etherization, which he afterwards penned for the North British Review (No. for May 1847), he stated to the late Dr Chalmers, who solicited him to undertake the task, that if he "wrote the medical Dr Chalmers should himself write the theological part." Dr Chalmers at once professed that he did not see any theological part pertaining to it. Mr Miller then explained to him, that some had been urging objections against the use of ether in midwifery, on the ground of its so far improperly enabling woman to avoid one part of the primeval curse. At last when Mr Miller was enabled to convince him that he was in earnest in saying that such ground *had* been taken, Dr Chalmers thought quietly for a minute or two, and then added, that if some "small theologians" really took such an improper

tences, I believe, were not uncommon almost within the memory of some aged members of the present generation. Sir Walter Scott, in his Old Mortality, introduces honest Mause Headrigg as charging the Lady Margaret Bellenden and the authorities at Tillietudlem with abetting this reprehensible practice. "And since your leddyship is pleased to speak o' parting wi' us, I am free to tell you a piece o' my mind in another article. Your leddyship and the steward hae been pleased to propose that my son Cuddie suld work in the barn wi' a new-fangled machine for dighting the corn frae the chaff, thus impiously thwarting the will of Divine Providence, by raising wind for your leddyship's ain particular use by human art, instead of soliciting it by prayer, or waiting patiently for whatever dispensation of wind Providence was pleased to send upon the sheeling hill." (*Chap.* vii.)

view of the subject, he would certainly advise Mr Miller not to "heed them" in his article. Dr Chalmers' mind was not one that could take up or harbour the extraordinary idea, that, under the Christian dispensation, the God of Mercy should wish for, and delight in, the sacrifice of women's screams and sufferings in childbirth. Perhaps he thought also, as I have heard other clergymen state, that if God has beneficently vouchsafed to us a means of mitigating the agonies of childbirth, it is His evident intention that we should employ these means. The very fact that we have the power by human measures to relieve the maternal sufferings, is in itself a sufficient criterion that God would rather that these sufferings be relieved and removed. If He had willed and desired them not to be averted, it would not be possible for man to avert them. For while it is our duty to avoid all misery and suffering that is avoidable, it would certainly be impossible for us to eschew any that God had permanently and irreversibly decreed should not be eschewed.

7. I have heard objections urged against the state of anæsthesia as a counteraction to pain in surgery and midwifery, on other and different grounds from any which I have yet noticed, viz., that in superinducing a temporary absence of *corporeal* sensibility, we also superinduce, at the same time, a temporary absence of *mental* consciousness. And it is argued that, as medical men, we are not entitled to put the activity and consciousness of the mind of any patient in abeyance, for the mere purpose of saving that patient from any bodily pain or agony. Some medical men even, have gravely pressed this argument. But if there were any propriety in it, why, then, these same medical men could never have been justified in doing what they

have, one and all of them, done perhaps hundreds of times; viz. exhibit, by the mouth, opium and other narcotics and hypnotics to their patients, to mitigate pain and superinduce anæsthesia and sleep. There is no greater impropriety or sin in producing sleep and freedom from pain by exhibiting a medicine by the mouth, than by exhibiting it by the lungs. There is *less* impropriety in the latter practice than in the former, even according to the very doctrine of these opponents. For narcotic or anæsthetic agents which are swallowed, are far more prolonged in their "insensibilizing" action upon both the mind and body than those that are inhaled. The questionable character of the practice (supposing it for a moment to be questionable), must be much less when the effect is short and evanescent, as with ether and chloroform when respired; than when it is long and protracted, as with opium, morphia, henbane, &c., when swallowed. The proper anæsthetic state is one physiologically and psychically analogous to natural deep sleep. It is an artificial deep sleep. Those who object and urge that we should never follow ourselves, or induce others to follow, the practice of voluntarily surrendering up our mental consciousness for a time, in order to avoid any corporeal torture or agony that we would otherwise endure during that time, forget how often and how long they and others are in the habit of voluntarily surrendering up their mental consciousness in common sleep, far, far beyond the time required merely for the refreshment and renovation of the system. Many thus *daily* surrender their minds and reason up for unnecessary hours to the state of unconsciousness existing in common or natural sleep, without any object except the reprehensible indulgence of sloth and indolence: and then they turn round, and declaim against others having induced upon them, at some *rare* and extraordinary time, the unconsciousness of artificial sleep, when there is a great and laudable object in view,—viz. the avoidance of excruciating corporeal suffering, and the saving of human life, by saving the human system from the shock and dangers accompanying that suffering.* Besides those that urge, on a kind of religious ground, that an artificial or anæsthetic state of unconsciousness should not be induced merely to save frail humanity from the miseries and tortures of bodily pain, forget that we have the greatest of all examples set before us for following out this very principle of practice. I allude to that most singular description of the preliminaries and details of the first surgical operation ever performed on man, which is contained in Genesis ii. 21 :—"And the Lord God caused a deep sleep to fall upon Adam ; and he slept ; and he took one of his ribs, and closed up the flesh instead thereof." In this remarkable verse the whole process of a surgical operation is briefly detailed. But the passage is principally striking, as affording evidence of our Creator himself using means to save poor human nature from the unnecessary endurance of physical pain. "It ought to be noted (observes Calvin in his commentary on this verse), that Adam was sunk into a profound sleep, in order that he might feel no pain."† In his collected commentaries on the same verse, Pool quotes different authorities for the same opinion, that this deep sleep was induced upon Adam in order that "he might not feel pain from the removal of the rib."* And the *profundity* of the sleep, as expressed in the Hebrew, is also worthy of note. For the noun "*tardemah*," translated in our version "deep sleep," † signifies, according to all the best Hebrew scholars, the deepest form of induced slumber. In the early and very literal Greek translation which Aquila made of the Bible, he renders, in this passage, the Hebrew word *tardemah* by the expressive Greek term *καταφορα*, a term which Hippocrates, Galen, Ætius, and other Greek physicians, used as implying that state of deep insensibility and total unconsciousness which in modern medical language we express by "coma" and "lethargy."‡ Gesenius renders *tardemah* by the Latin word "sopor," the Hebrew term for common sleep being *shenah*. In the Vulgate it is translated "sopor" (*immisit Deus soporem in Adam*). In the quotation which I have given from Calvin, that great authority renders the term *tardemah* by the expression, profound "sopor" (*profundo sopore*); and Pool quotes different authorities to show that the Hebrew word does signify "sopor" of a profound kind, "*notat profundum soporem.*"*

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* See evidence of its saving human life, as well as saving human suffering, under surgical operations, in a table which I have given of the results of amputations with and without etherization, at p. 11 of "Remarks on the Superinduction of Anæsthesia in Natural and Morbid Parturition."

† "Notandum, Adam profundo sopore fuisse demersum, ut nihil doloris sentiret."—*Johannis Calvini in Librum Geneseos Commentarius* (Hengstenberg's Edit. p. 36).

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* "Ne ablationis costæ dolorem sentiret."—*Poli Synopsis Criticorum aliorumque Scripturæ Interpretum.* Vol. I. p. 29.—See also the same opinion expressed in Rosenmuller's *Scholia Vetus in Testamentum*, vol. I. p. 106, "Adamo, somno sopito, ne dolorem sentiret:" and in the English Commentaries of Bishop Patrick, p. 14, "Whereby he was made less sensible of the pain, which otherwise he would have felt in the opening his side;" and of Drs D'Oyly and Mant, "Adam was thus less sensible of bodily pain;" &c. &c.

† In Luther's German Bible, an exactly corresponding expression "*tiefen schlaf*" is used. In Dathe's valued Latin version of the Pentateuch, a similar translation is given, "*Deus gravem Adamo soporem immisit*," p. 27.

‡ "Cataphora (from *καταφερω* to sink or fall down,) a term used by some authors to designate a state of coma, and by others an unusually profound sleep."—*Hooper's Medical Dictionary.*

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* See his *Synopsis Criticorum et Scripturæ Interpretum*, p. 29.

THE END.

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ACCOUNT

OF A

NEW ANÆSTHETIC AGENT,

AS A

SUBSTITUTE FOR SULPHURIC ETHER

IN

SURGERY AND MIDWIFERY,

BY

J. Y. SIMPSON, M.D., F.R.S.E.,

PROFESSOR OF MIDWIFERY IN THE UNIVERSITY OF EDINBURGH;
PHYSICIAN-ACCOUCHEUR TO THE QUEEN IN SCOTLAND, ETC.

> "I esteem it, the office of a Physician, not only to restore health, but to mitigate pain and dolours."—Bacon.

COMMUNICATED TO THE MEDICO-CHIRURGICAL SOCIETY OF EDINBURGH,
AT THEIR MEETING ON 10TH NOVEMBER 1847.

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TO

M. J. DUMAS,

MEMBER OF THE INSTITUTE,

DEAN OF THE FACULTY OF SCIENCES, PARIS,

&c. &c. &c.

ON CHLOROFORM.

From the time at which I first saw Ether-Inhalation successfully practised in January last, I have had the conviction impressed upon my mind, that we would ultimately find that other therapeutic agents were capable of being introduced with equal rapidity and success into the system, through the same extensive and powerful channel of pulmonary absorption. In some observations, which I wrote and published in February last, relative to the inhalation of sulphuric ether in midwifery, I stated that, in several obstetric cases, I had used ergot of rye in this way, along with ether.—(See *Monthly Journal of Medical Science*, pp. 724; and 795, case of successful inhalation of opium, to arrest the vomiting of pregnancy.)

With various professional friends, more conversant with chemistry than I am, I have, since that time, taken opportunities of talking over the idea which I entertained of the probable existence or discovery of new therapeutic agents, capable of being introduced into the system by respiration, and the possibility of producing for inhalation vaporizable or volatile preparations of some of our more active and old established medicines: and I have had, during the summer and autumn, ethereal tinctures, &c., of several potent drugs, manufactured for me, for experiment, by Messrs Duncan, Flockhart, & Co., the excellent chemists and druggists of this city.

Latterly, in order to avoid, if possible, some of the inconveniences and objections pertaining to sulphuric ether,—(particularly its disagreeable and very persistent smell, its occasional tendency to irritation of the bronchi during its first inspirations, and the large quantity of it occasionally required to be used, more especially in protracted cases of labour,)—I have tried upon myself and others the inhalation of different other volatile fluids, with the hope that some one of them might be found to possess the advantages of ether, without its disadvantages. For this purpose, I selected for experiment and have inhaled several chemical liquids of a more fragrant or agreeable odour, such as the chloride of hydro-carbon (or Dutch liquid), acetone, nitrate of oxide of ethyle (nitric ether), benzin, the vapour of iodoform, &c.*

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* In talking over, with different chemists, what fluids might be sufficiently volatile to be respirable, and hence deserving of being experimented upon, Mr Waldie first named to me the Perchloride of Formyle as worthy, among others, of a trial;—Dr Gregory suggested a trial of the chloride of hydrocarbon, &c. I have been deeply indebted to Dr

I have found, however, one infinitely more efficacious than any of the others, viz., Chloroform, or the Perchloride of Formyle, and I am enabled to speak most confidently of its superior anæsthetic properties, having now tried it upon upwards of thirty individuals. The liquid I have used has been manufactured for me by Mr Hunter, in the laboratory of Messrs Duncan, Flockhart, & Co.

Chloroform was first discovered and described at nearly the same time by Soubeiran (1831), and Liebig, (1832); its composition was first accurately ascertained by the distinguished French chemist, Dumas, in 1835.—See the *Annales de Chimie et de Physique*, vols. xlviii. xlix. and lviii. It has been used by some practitioners internally; Guillot prescribed it as an anti-spasmodic in asthma, exhibiting it in small doses, and diluted 100 times.—(See Bouchardat's *Annuaire de Therapeutique* for 1844, p. 35.) But no person, so far as I am aware, has used it by inhalation, or discovered its remarkable anæsthetic properties till the date of my own experiments.

It is a dense, limpid, colourless liquid, readily

Gregory and Dr Anderson, for their kindness in furnishing me with the requisite chemical agents for these experiments;—and also to my assistants, Dr Keith and Dr Duncan, for the great and hearty zeal with which they have constantly aided me in conducting the inquiry.

evaporating, and possessing an agreeable, fragrant, fruit-like odour, and a saccharine pleasant taste.

As an inhaled anæsthetic agent, it possesses over sulphuric Ether the following advantages:—

1. A greatly less quantity of Chloroform than of Ether is requisite to produce the anæsthetic effect; usually from a hundred to a hundred and twenty drops of Chloroform only being sufficient; and with some patients much less. I have seen a strong person rendered completely insensible by six or seven inspirations of thirty drops of the liquid.

2. Its action is much more rapid and complete, and generally more persistent. I have almost always seen from ten to twenty full inspirations suffice. Hence the time of the surgeon is saved; and that preliminary stage of excitement, which pertains to all narcotizing agents, being curtailed, or indeed practically abolished, the patient has not the same degree of tendency to exhilaration and talking.*

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* In practice I have found that any such tendency, even with ether, is avoided by, 1st, giving the patient from the first a large and overwhelming dose of the vapour, and 2ndly, by keeping him perfectly quiet and still, and preventing all noise and talking around him. I have elsewhere insisted on the importance of these points. (See the numbers of the Monthly *Journal of Medical Science* for March, 1847. p. 726, and for September, p. 154). In the paper last re-

3. Most of those who know from previous experience the sensations produced by ether inhalation, and who have subsequently breathed the Chloroform, have strongly declared the inhalation and influence of Chloroform to be far more agreeable and pleasant than those of Ether.

4. I believe, that considering the small quantity requisite, as compared with Ether, the use of Chloroform will be less expensive than that of Ether;

ferred to, I took occasion, when discussing the conditions requisite for insuring successful etherization, to observe, "*First,* The patient ought to be left, as far as possible, in a state of absolute quietude and freedom from mental excitement, both during the induction of etherization, and during his recovery from it. All talking and all questioning should be strictly prohibited. In this way any tendency to excitement is eschewed, and the proper effect of the ether inhalation more speedily and certainly induced. And, *Secondly,* with the same view, the primary stage of exhilaration should be entirely avoided, or at least reduced to the shortest possible limit, by impregnating the respired air as fully with the ether vapour as the patient can bear, and by allowing it to pass into the lungs both by the mouth and nostrils, so as rapidly and at once to superinduce its complete and anæsthetic effect; * * * * a very common but certainly a very unpardonable error being to exhibit an imperfect and exciting, instead of a perfect and narcotizing dose of the vapour. Many of the alleged failures and misadventures are doubtless entirely attributable to the neglect of this simple rule;—not the principle of etherization, but the mode of putting it in practice being altogether to blame. But, *Thirdly,* whatever means or mode of etherization is more especially, as there is every prospect that the means of forming it may be simplified and cheapened.

5. Its perfume is not unpleasant, but the reverse; and the odour of it does not remain, for any length of time, obstinately attached to the clothes of the attendant,—or exhaling in a disagreeable form from the lungs of the patient, as so generally happens with Sulphuric Ether.

6. Being required in much less quantity, it is much more portable and transmissible than Sulphuric Ether.

7. No special kind of inhaler or instrument is necessary for its exhibition. A little of the liquid diffused upon the interior of a hollow-shaped sponge, or a pocket-handkerchief, or a piece of linen or paper, and held over the mouth and nostrils, so as to be fully inhaled, generally suffices in about a minute or two to produce the desired effect.*

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adopted, the most important of the conditions required for procuring a satisfactory and successful result from its employment in surgery, consists in obstinately determining to avoid the commencement of the operation itself, and never venturing to apply the knife *until* the patient is under the full influence of the ether-vapour, and *thoroughly and indubitably soporized by it.*" In fulfilling all these indications, the employment of Chloroform evidently offers great and decided advantages, in facility and efficiency, over the employment of Ether.

* When used for surgical purposes, perhaps it will be found to be

I have not yet had an opportunity of using Chloroform in any capital surgical operation, but have exhibited it with perfect success, in tooth-drawing,[*]

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most easily given upon a handkerchief, gathered up into a cup-like form in the hand of the exhibitor, and with the open end of the cup placed over the nose and mouth of the patient. For the first inspiration or two, it should be held at the distance of half an inch or so from the face, and then more and more closely applied to it. To insure a rapid and perfect anæsthetic effect—more especially where the operation is to be severe—one or two teaspoonfuls of the Chloroform should be at once placed upon the hollow of the handkerchief, and immediately held to the face of the patient. Generally a snoring sleep speedily supervenes; and when it does so, it is a perfect test of the superinduction of complete insensibility. But a patient may be quite anæsthetic without this symptom supervening.

[*] A young dentist who has himself had two teeth extracted lately,—one under the influence of Ether, and the other under the influence of Chloroform,—writes me the following statement of the results:—"About six months ago I had an upper molar tooth extracted whilst under the influence of Ether, by Mr Imlach. The inhalation was continued for several minutes before I presented the usual appearance of complete etherization; the tooth was then extracted; and, although I did not feel the least pain, yet I was conscious of the operation being performed, and was quite aware when the crash took place. Some days ago I required another molar extracted on account of tooth-ache, and this operation was again performed by the same gentleman. I inhaled the vapour of Chloroform, half a drachm being poured upon a handkerchief for that purpose, and held to my nose and mouth. Insensibility took place in a few seconds; but I was so completely *dead* this time, that I was not in the very slightest degree aware of any thing that took place. The subsequent stupifying effects of the Chloroform went off more rapidly than those of the Ether; and I was perfectly well and able again for my work in a few minutes."

opening abscesses, for annulling the pain of dysmenorrhœa and of neuralgia, and in two or three cases where I was using deep, and otherwise very painful galvano-puncture for the treatment of ovarian dropsy, &c. I have employed it also in obstetric practice with entire success. The lady to whom it was first exhibited during parturition, had been previously delivered in the country by perforation of the head of the infant, after a labour of three days' duration. In this, her second confinement, pains supervened a fortnight before the full time. Three hours and a-half after they commenced, and, ere the first stage of the labour was completed, I placed her under the influence of the Chloroform, by moistening, with half a tea-spoonful of the liquid, a pocket handkerchief, rolled up into a funnel shape, and with the broad or open end of the funnel placed over her mouth and nostrils. In consequence of the evaporation of the fluid, it was once more renewed in about ten or twelve minutes. The child was expelled in about twenty-five minutes after the inhalation was begun. The mother subsequently remained longer soporose than commonly happens after Ether. The squalling of the child did not, as usual, rouse her; and some minutes elapsed after the placenta was expelled, and after the child was removed by the nurse into another room, before the patient awoke. She then turned round and observed to me that she had "enjoyed a very comfortable sleep, and indeed required it, as she was so tired,* but would now be more able for the work before her." I evaded entering into conversation with her, believing, as I have already stated, that the most complete possible quietude forms one of the principal secrets for the successful employment of either Ether or Chloroform. In a little time she again remarked that she was afraid her "sleep had stopped the pains." Shortly afterwards, her infant was brought in by the nurse from the adjoining room, and it was a matter of no small difficulty to convince the astonished mother that the labour was entirely over, and that the child presented to her was really her " own living baby."

Perhaps I may be excused from adding, that since publishing on the subject of Ether Inhalation in Midwifery, seven or eight months ago,† and then for the first time directing the attention of the medical profession to its great use and importance in natural and morbid parturition, I have employed it, with few and rare exceptions, in every case of labour that I have attended ; and with the most delightful results.

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* In consequence of extreme anxiety at the unfortunate result of her previous confinement, she had slept little or none for one or two nights preceding the commencement of her present accouchement.

† See *Monthly Journal of Medical Science* for February, p. 639 ; for March, p. 718 and 721 ; and April, p. 794, &c.

And I have no doubt whatever, that some years hence the practice will be general. Obstetricians may oppose it, but I believe our patients themselves will force the use of it upon the profession.* I have never had the pleasure of watching over a series of better and more rapid recoveries; nor once witnessed any disagreeable result follow to either mother or child; whilst I have now seen an immense amount of maternal pain and agony saved by its employment. And I most conscientiously believe that the proud mission of the physician is distinctly twofold—namely, to alleviate human suffering, as well as preserve human life.

CHEMICAL CONSTITUTION OF CHLOROFORM.

Formyle is the hypothetical radical of Formic acid. In the red ant (*Formica rufa*) formic acid was first discovered, and hence its name. Gehlen pointed it out as a peculiar acid; and it was afterwards first artificially prepared by Doebereiner.

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* I am told that the London physicians, with two or three exceptions only, have never yet employed ether-inhalation in their Midwifery practice. Three weeks ago, I was informed in a letter from Professor Montgomery of Dublin, that he believed that in that city, up to that date, it had not been used in a single case of labour.

Chemists have now devised a variety of processes, by which formic acid may be obtained from starch, sugar, and, indeed, most other vegetable substances.

A series of Chlorides of Formyle are produced when chlorine and the hypochlorites are brought to act on the chloride, oxide, and hydrated oxide of methyle, (pyroxylic or wood spirit). In the same way as formic acid may be artificially procured from substances which do not contain Formyle ready formed,—so also are the Chlorides of this radical capable of being procured from substances which do not originally contain it.

Chloroform, Chloroformyle, or the Perchloride of Formyle, may be made and obtained artificially by various processes,—as by making milk of lime, or an aqueous solution of caustic alkali act upon chloral,—by distilling alcohol, pyroxylic spirit, or acetone, with chloride of lime,—by leading a stream of Chlorine gas into a solution of caustic potass in spirit of wine, &c. The preparation which I have employed, was made according to the following formula of Dumas:—

" ℞ Chloride of lime in powder, . . .	℔. IV.
Water, ...	℔. XII.
Rectified Spirit, ...	f ℥ XII.

"Mix in a capacious retort or still, and distill as long as a dense liquid, which sinks in the water with which it comes over, is produced."—(Gray's *Supplement to the Pharmacopœia*, 1846, p. 633).

The resulting Perchloride of Formyle consists of two atoms of Carbon, one of Hydrogen, and three of Chlorine. Its specific gravity is much greater than that of water, being as high as 1·480. It boils at 141°. The density of its vapour is 4·2. It is not inflammable; nor changed by distillation with potassium, potash, sulphuric, or other acids.—(See Turner's *Elements of Chemistry*, 8th edition, p. 1009; Gregory's *Outlines of Chemistry*, part ii. p. 401; Fownes' *Manual of Elementary Chemistry*, p. 419; Thomson's *Chemistry of Organic Bodies*, p. 312; Loewig's *Organische Chemie*, vol. i. p. 498).

It is now well ascertained that three compound chemical bodies possess, when inhaled into the lungs, the power of superinducing a state of anæsthesia, or insensibility to pain in surgical operations, &c., namely, Nitrous Oxide, Sulphuric Ether, and Perchloride of Formyle. The following tabular view shows that these agents are entirely different from each other in their chemical constitution, and hence that their elementary composition affords no apparent clue to the explanation of their anæsthetic properties:—

	Propor. of Nitrogen.	Propor. of Oxygen.	Propor. of Carbon	Propor. of Hydrogen.	Propor. of Chlorine.
Nitrous Oxide,	1 Atom.	1 Atom.	...	...	. .
Sulphuric Ether,	...	1 Atom.	4 Atoms.	5 Atoms.	...
Chloroform,	..	...	2 Atoms.	1 Atom.	3 Atoms.

It is perhaps not unworthy of remark, that when Soubeiran, Liebig, and Dumas engaged, a few years back, in those inquiries and experiments by which the formation and composition of Chloroform was first discovered, their sole and only object was the investigation of a point in philosophical Chemistry. They laboured for the pure love and extension of knowledge. They had no idea that the substance to which they called the attention of their chemical brethren could or would be turned to any *practical* purpose, or that it possessed any physiological or therapeutic effects upon the animal economy. I mention this to show, that the *cui bono* argument against philosophical investigations, on the ground that there may be at first no apparent practical benefit to be derived from them, has been amply refuted in this, as it has been in many other instances. For I feel assured, that the use of Chloroform will soon entirely supersede the use of Ether; and, from the facility and rapidity of its exhibition, it will be employed as an anæsthetic agent in many cases, and under many circumstances, in which Ether would never have been had recourse to. Here then we have a substance which, in the first instance, was merely interesting as a matter of scientific curiosity and research, becoming rapidly an object of intense importance, as an agent by which human suffering and agony may be annulled and abolished, under some of the most trying circumstances in which human nature is ever placed.

POSTSCRIPT.

Since the above observations were sent to the press, I have—through the great kindness of Professor Miller and Dr Duncan—had an opportunity of trying the effects of the inhalation of Chloroform, to-day, in three cases of operation in the Royal Infirmary of Edinburgh. A great collection of professional gentlemen and students witnessed the results, and among the number was Professor Dumas of Paris, the chemist who first ascertained and established the chemical composition of Chloroform. He happened to be passing through Edinburgh, engaged along with Dr Milne Edwards, who accompanied him, in an official investigation for the French Government,—

and was, in no small degree, rejoiced to witness the wonderful physiological effects of a substance with whose chemical history his own name was so intimately connected.

I append notes, obligingly furnished to me by Professor Miller and Dr Duncan, of the three cases of operation. The two first cases were operated on by Professor Miller; the third by Dr Duncan. In applying the Chloroform in the first case, I used a pocket-handkerchief as the inhaling instrument; in the two last I employed a hollow sponge.

Case I.—" A boy, four or five years old, with necrosis of one of the bones of the fore-arm. Could speak nothing but Gaelic. No means, consequently, of explaining to him what he was required to do. On holding a handkerchief, on which some Chloroform had been sprinkled, to his face, he became frightened, and wrestled to be away. He was held gently, however, by Dr Simpson, and obliged to inhale. After a few inspirations he ceased to cry or move, and fell into a sound snoring sleep. A deep incision was now made down to the diseased bone; and, by the use of the forceps, nearly the whole of the radius, in the state of sequestrum, was extracted. During this operation, and the subsequent examination of the wound by the finger, not the slightest evidence of the suffering of pain was given. He still slept on soundly, and was carried back to his ward in that state. Half an hour afterwards, he was found in bed, like a child newly awakened from a refreshing sleep, with a clear merry eye, and placid expression of countenance, wholly unlike what is found to obtain after ordinary etherization. On being questioned by a Gaelic interpreter who was found among the students, he stated that he had never felt any pain, and that he felt none now. On being shown his wounded arm, he looked much surprised, but neither cried nor otherwise expressed the slightest alarm."

Case II.—"A soldier who had an opening in the cheek—the result of exfoliation of the jaw—was next made to inhale. At first he showed some signs of moving his hands too freely; but soon also fell into a state of sleep and snoring. A free incision was made across the lower jaw, and from this the dense adhering integuments were freely dissected all round, so as to raise the soft parts of the cheek. The edges of the opening were then made raw, and the whole line of incision was brought together by several points of suture. This patient had previously undergone two minor operations of a somewhat similar kind; both of them had proved unsuccessful, and he bore them very ill—proving unusually unsteady, and complaining bitterly of severe pain. On the present occasion, he did not wince or moan in the slightest degree; and, on the return of consciousness, said that he had felt nothing. His first act, when apparently about half awake, was suddenly to clutch up the sponge with which the Chloroform was used, and re-adjust it to his mouth, obviously implying that he had found the inhalation from it any thing but a disagreeable duty.

"This case was further interesting as being one of those operations in the region of the mouth, in which it has been deemed impossible to use ether,—and certainly it would have been impossible to have performed the operation with any complicated inhaling apparatus applied to the mouth of the patient."

CASE III.—"A young man, of about twenty-two years of age, having necrosis of the first phalanx of the great toe, and ulceration of the integuments, the consequence of injury. The ulcerated surface was exceedingly tender to the touch—so much so, that he winced whenever the finger was brought near to it; and the slightest pressure made him cry out. After the removal of the dressings, which caused some pain and fretting, the inhalation was commenced, and the patient almost immediately* became insensible, and lay perfectly still, while the diseased mass was being removed by amputation of the toe through the middle of the second phalanx. The inhalation was now stopped. The edges of the wound were then brought together with three stitches, and the wound dressed. The patient shortly afterwards awoke, looked round him, and gratefully declared his entire and perfect freedom from all pain and uneasiness during the operation."

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* Dr Christison, who was watching the result, informs me that this patient was affected in half a minute.

The whole quantity of Chloroform used in these three operations did not exceed half an ounce,—and, as Professor Miller afterwards observed to the students that were present, if ether had been used, several ounces of it would have been requisite to produce the same amount of anæsthetic effect.

The following case occurred also to-day, to Mr Miller, in private practice. The notes of it and the subsequent remark are in his own words.

Case IV.—" A young lady wished to have a tumour (encysted) dissected out from beneath the angle of the jaw. The Chloroform was used in small quantity (about a drachm), sprinkled upon a piece of operation sponge. In considerably less than a minute she was sound asleep, sitting easily in a chair, with her eyes shut, and with her ordinary expression of countenance. The tumour was extirpated, and a stitch inserted, without any pain having been either shown or felt. Her sensations, throughout, as she subsequently stated, had been of the most pleasing nature; and her manageableness during the operation was as perfect as if she had been a wax doll or a lay figure.

"No sickness, vomiting, headache, salivation, uneasiness of chest, in any of the cases. Once or twice a tickling cough took place in the first breathings."

I have, up to this date, exhibited the Chloroform to about fifty individuals. In not a single instance has the slightest bad result of any kind whatever occurred from its employment.

EDINBURGH, 15*th November* 1847.

FINIS.

MURRAY AND GIBB, PRINTERS, EDINBURGH.

THE

CLIMATE

OF

TORQUAY,

By EDWARD VIVIAN, Esq.,

A PAPER READ BEFORE THE MEMBERS OF THE TORQUAY NATURAL HISTORY
SOCIETY, AT THEIR MONTHLY MEETING IN SEPTEMBER, 1846,
AND PUBLISHED AT THEIR REQUEST.

THE PROFITS (IF ANY) WILL BE GIVEN TO THE TORQUAY NATURAL
HISTORY SOCIETY.

LONDON:
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COCKREM, TORQUAY.

MDCCCXLVI.

CLIMATE OF TORQUAY.

——— Sunny Devon, moist with rills,
A nunnery of cloistered hills,
The elements presiding.

* * * * * * *

For here all summers are comprised,
The nightly frosts shrink exorcised,
Before the priestly moonshine.
And every wind with stolid feet,
In wandering down the alleys sweet,
Steps lightly on the sunshine.

Miss Barrett.

Celebrated as Torquay has long been for its mild winter climate, it is singular, that, even on this point, so little has hitherto been known of its statistics, and that in other important particulars such erroneous impressions should still prevail.

Sir James Clark, who has paid more attention to this subject than any other writer, was compelled to omit Torquay altogether from most of the tables in the former editions of his work on climate ; and in reference to the winter temperature, which was the only point upon which he could give any information, he had no ground for his calculations, but the occasional observations of Drs. Barry, Foot, and Coldstream, during the winters of 1827-29-30, and the imperfect tables given in the Panorama of Torquay.

Dr. Shapter, in his Climate of Devon, equally regrets the absence of any sufficient observations, and follows those of Sir James Clark.

Dr. Granville, whose visit of a few hours could have afforded him no means of personal observation, and who does not appear, even to have made himself acquainted with the tables which had then been published in the Environs of Torquay, and the Torquay Guide, relies upon the same Authorities, together with some unpublished observations made at Bath and Clifton.

The following statements are founded principally upon the Tables in the last edition of Sir James Clark's work on Climate, which contain the observations, made during the last five years at East Braddons and Woodfield, the Reports of the Registrar General, Dr. Shapter's Climate of Devon, the observations taken at the Bristol Institution, and the Parochial Registers of this parish.

MEAN TEMPERATURE.

	Annual	Winter	Spring	Summer	Autumn
Torquay, (Woodfield)	52.1	44.0	50.0	61.2	53.1
Cove	51.9	44.1	50.1	61.3	52.0
Penzance	51.8	44.0	49.6	60.2	53.3
Undercliff	51.3	41.8	49.6	60.6	53.5
Clifton	51.2	39.9	49.7	63.8	51.4
Exeter	51.2	41.4	49.5	62.0	51.9
Hastings	50.4	39.0	47.4	61.7	52.2
London	50.3	39.1	48.7	62.3	51.3
Sidmouth	50.1	40.3	48.1	60.2	51.6
Chiswick	49.9	38.6	48.5	62.2	50.1
Newport, (I. of White)	49.7	38.5	48.1	61.1	50.6
Nice	59.4	47.8	56.2	72.2	61.6
Rome	”	46.8	”	”	”
Madeira	64.9	60.6	62.3	69.5	67.3

MEAN EXTREME RANGE OF TEMPERATURE.

	Annual	Winter	Spring	Summer	Autumn
Torquay, (Woodfield)	51	29	42	30	38
Cove	48	26	39	34	32
Penzance	49	27	33	27	32
Undercliff	57	29	43	35	42
Clifton	59	33	44	30	46
Exeter	59	29	43	36	43
Hastings	61	33	44	39	41
London	64	32	46	48	48
Sidmouth	57	31	43	35	43
Chiswick	67	38	54	44	53
Newport	59	31	48	41	52
Nice	60	32	36	29	39
Rome	62	31	43	31	46
Madeira	31	21	22	24	25

THE HIGHEST AND LOWEST DEGREES OF TEMPERATURE DURING THE QUARTER ENDING THE 30TH JUNE, 1846.

	Highest	Lowest	Difference
Bath	94	26	68
Uckfield	92½	29	63½
Highfield, Notts.	91	33	58
Thwaite, Suffolk	89½	34	55½
Cambridge	87	30	57
London	87	33	54
Derby	85	28	57
Oakham, Rutland	85	42	43
Newcastle	84	32	52
Helston	84	49	35
Chichester	83	34	49
Whitehaven..	83	33½	49½
Durham	83	31	52
Harraby, Carlisle	83	27	56
North Shields	82	31	51
Gosport	81	31	50
Torquay	80	38	42
Falmouth	78	38	40
Truro	77	38	39

AVERAGE NUMBER OF DAYS UPON WHICH RAIN FALLS.

	Annual	Winter	Spring	Summer	Autumn
Torquay	132	35	30	32	35
Cove	131	37	29	30	35
Penzance	178	50	40	39	48
Undercliff..	146	39	32	33	42
Clifton	169	45	36	41	45
Exeter	162	42	36	41	41
Hastings	153	39	31	33	49
London	178	48	43	44	43
Sidmouth	141	40	33	32	35
Newport	185	49	45	42	49
Grassmere	196	56	39	47	57
Rome..	117	35	30	17	34
Madeira	70	23	18	6	22

QUANTITY OF RAIN IN INCHES.

	Annual	Winter	Spring	Summer	Autumn
Torquay	28.20	6,82	5.61	6.38	9.39
Cove	33.25	10.54	4.05	7.05	11.92
Penzance	44.66	12.64	9.35	9.34	13.33
Undercliff	23.48	4.65	4.06	4.29	9.48
Clifton	32.56	8.43	5.69	9.44	9.00
Exeter	31.90	9.10	6.55	7.10	9.20
Hastings	32.81	7.59	5.80	6.40	13.02
London	24.80	5.85	4.80	6.67	7.43
Sidmouth	22.68	5.29	5.57	5.66	7.46
Chiswick	24.04	4.66	4.58	6.79	8.01
Newport	33.60	7.87	6.45	6.48	12.90
Grassmere	121.00	40.88	18.66	21.28	40.04
Nice	26.81	7.30	6.64	2.75	10.12
Rome	31.11	9.49	6.29	4.16	11.17
Madeira	29.23	11.40	5.77	1.45	10.61

AVERAGE NUMBER OF DAYS UPON WHICH RAIN FALLS.

Torquay	132	35	30	32	35
Average of other Places	160	43	36	37	43
Difference in favour of Torquay.	28	8	6	5	8

QUANTITY OF RAIN IN INCHES.

	Annual	Winter	Spring	Summer	Autumn
Torquay.	28.20	6.82	5.61	6.38	9.39
Average of other places	30.37	7.66	5.69	6.92	10.17
Difference in favour of Torquay	2.17	0.84	0.08	0.54	0.78

Grassmere is not included in this Average, the fall of rain in the lake districts being so excessive.

THE MEAN DEW-POINT AND MEAN TEMPERATURE, FOR THE QUARTER ENDING THE 30TH OF JUNE, 1846.

	Temp.	Dew.	Diff.
Chichester	56.5	37.1	19.4
Torquay	57.5	48.1	9.4
Whitehaven	54.9	46.9	8.0
London	55.2	48.3	6.9
Brighton	56.7	49.9	6.8
Uckfield	55.9	49.7	6.2
Helston	56.0	50.6	5.4
Newcastle	53.1	51.7	1.4

As compared with Clifton, which Dr. Chisholm describes as possessing "an atmosphere elastic, vivifying, *not humid*," and which Sir James Clark pronounces to be "the driest climate in the West of England," Torquay appears to great advantage. The following Table is compiled from observations taken at the Bristol Institution and at Woodfield Torquay, during the years 1842—3—4—5, and at Exeter, from 1832 to 1836, as given by Dr. Shapter in his Climate of Devon.

TORQUAY.

	Winter	Spring	Summer	Autumn	Annual
Temperature	43.5	55.4	59.9	49.5	52.7
Dew-point	39.4	47.4	53.6	45.3	45.9
Difference	4.1	8.0	6.3	4.2	6.8

BRISTOL.

	Winter	Spring	Summer	Autumn	Annual
Temperature	41.3	56.8	62.4	47.6	52.2
Dew-point	38.7	51.5	57.7	46.5	48.6
Difference	2.6	5.3	4.7	1.1	3.6

EXETER.

	Winter	Spring	Summer	Autumn	Annual
Temperature	41.0	54.8	60.8	45.8	50.6
Dew-point	38.6	48.0	53.6	43.5	45.9
Difference	2.4	6.8	7.2	2.3	4.7

By this statement Torquay is *sensibly* drier than Clifton by 1.6 degrees in Summer and *absolutely* drier by 4.1 degrees, whilst it is cooler as regards the mean temperature by 2.5 degrees in Summer, and much more so at the extremes, if we may judge from Bath which was 94 degrees whilst Torquay was only 80, during the past quarter.

The Dew-point, it may be necessary to observe, is that degree of temperature at which the air is saturated, and shews the *absolute* amount of moisture in the atmosphere; the difference between the dew-point and the temperature, shews the *sensible* dryness of the air, and is by far the most important index of climate; for the same absolute quantity of moisture in the air at a low temperature would produce a fog, whilst with a high temperature the air would be dry and parching, though containing the same amount of aqueous vapour. The absolute amount of moisture in the air is, however, of considerable importance, as, the interior of the house or sick room being kept at nearly the same temperature, the introduction of air with a low dew-point, will occasion a great difference between the temperature and dew-point of the room, although the difference out of doors might not have been great. In its effect upon the lungs the actual dew-point is the principal consideration. Air saturated with moisture at the external temperature, on its introduction into the body, which possesses at all seasons nearly the same animal heat, rapidly absorbs moisture as its temperature rises, affording a beautiful compensation for the suppression of perspiration by cold, but occasioning a very serious disturbance in the action of delicate lungs, when the transfer of this important function is sudden, or to any great extent. A cubic foot of air at the freezing point contains, when saturated, 2.5 grains of water—at blood heat it is capable of absorbing 18.5 grains; so that at every breath in frosty weather, several grains of moisture are abstracted from the lungs. In this respect the humidity of our winter climate is of great service, provided it does not amount to absolute saturation, which is very rarely the case.

The range of the Dew-point in Torquay is very small as compared with other parts of the country, this arises partly from its equability of temperature, and principally from its geographical position. The East wind is always dry, from passing over the Continent, whilst the West is saturated with moisture from the Atlantic, and the vapours arising from the gulph stream. This inequality is corrected, in a great measure, on this coast from there being a great extent of sea on the East, and on the West the high range of moors which abstract the surplus moisture, the fall of rain being about a third more in the central parts of Devon and Cornwall than in Torquay;—the East wind on the contrary is tempered in its passage through the whole length of the Channel, an advantage peculiar to this portion of the coast.

The drying quality of the air is greatly increased by its being in motion, and in this respect Torquay is greatly favoured: although screened from the violence of every wind, there is never an entire calm: whether this is owing to the circling course of the tides in our bay, itself within the great western bay, or our situation upon a promontory in the great peninsula of the Western Counties, which affords the alternations of a sea and land wind on nearly three-quarters of the compass—the fact is unquestionable, —there is a breeze in Torquay even when vessels are lying becalmed in the offing, and the clouds are resting motionless on Dartmoor.

The advantage which has been shown to exist in regard to the ordinary fall of rain and proportion of wet days, is felt in a still more remarkable degree in our almost entire exemption from thunder storms; not a pane of glass has, I believe, ever been broken, in this immediate neighbourhood, by hail—certainly not within the last fifteen years; and although an occasional thunder shower passes within a short distance, there is no record of any injury having been occasioned by lightning; this exemption is very remarkable, and is doubtless owing to some peculiarity in the course of the electrical currents of which very little is known;—whatever may be the cause, it conduces in no small degree to the enjoyment of the country, and is of the greatest importance to invalids who are frequently affected by the slightest changes in the electrical condition of the atmosphere. During the late severe storms which raged with destructive fury, on two occasions, as near as the coast of Exmouth and Sidmouth, a slight thunder-shower was all that was experienced in Torquay.

From the great advantages which Torquay possesses in regard to situation and climate, we should naturally anticipate a corresponding superiority in the returns of mortality and health.

In a population so fluctuating as that of Torquay, and so rapidly increasing, by the accession in a great measure of invalid families, it is difficult to obtain the data for a safe estimate. In the following statement, the returns for Torquay are deduced from the deaths recorded in the Parish Register, from the years 1813 to 1830 inclusive, which present more faithfully than any of a more recent date the mortality of the native inhabitants; the returns for other places are taken from the reports of the Registrar General:—

The proportion out of 1000 deaths which have occurred at various ages, in England and Wales, in Devon, and in the Parish of Tormoham.

		England and Wales.	Devon.	Tormoham.
Under 20 years		586	514	569
20	50	194	185	187
60	70	80	92	75
70	80	83	122	88
80	90	49	73	69
90	100	8	14	12

This statement shews the superior longevity of the inhabitants of Devon as compared with those of England and Wales generally. The actual returns for Tormoham would appear to be below the average of the County, but if the rapid increase of the population and mortality (from 1350 in A.D. 1811, to 3582 A.D. 1831, and from 15 deaths in A.D. 1813 to 53 in 1830,) be taken into account, and the effect produced upon the averages by a great proportion of those who imigrate into the parish being below the middle age of life, this calculation would unquestionably place the longevity of Torquay as far above the average of the County, as that is above other parts of the kingdom.

The following statement shews the number out of every 1000 deaths, in the different districts of England and Wales, which occurred above the age of 60 years:—

Cumberland &c.	306	Leicester	241
Devon	300	Durham, mining parts	227
Durham &c.	291	Lincoln &c.	224
Dorset &c.	284	Stafford &c.	220
Norfolk &c.	279	London	184
Sussex &c.	264	York, West Riding	181
Somerset	264	Stafford, mining parts	150
Wales	263	Lancashire, except Manchester & Liverpool	147
Hertford &c.	260	Liverpool	118
Essex	255	Manchester	104
Oxford &c.	254	England and Wales	220
Cornwall	250		
York City and East Riding	244		

The proportion out of every 1000 who exceeded 70 years in England and Wales generally is 140, in Devon 208.

Mean annual Mortality per cent. occasioned by different classes of disease in England and Wales, (E. & W.); the Western Counties, (W. C.) viz. Wilts, Dorset, Somerset, Devon, and

Cornwall; Devonshire, (D.); and in Torquay and the 38 adjoining Parishes included in the Newton Union, (T.)

	E. & W.	W.C.	D.	T.
Epidemic and Contagious	45	42	38	34
Nervous System	33	22	23	19
Respiratory Organs including Pthisis.	60 [39	51 34	48 31	43 28]
Digestive Organs......	13	09	08	08
Other Causes	69	69	72	68
Total Mortality ..	2.20	1.93	1.89	1.72

From this Table it appears that the Annual Mortality of the Newton Union, in which Torquay is situated, is about one eleventh below the average of Devonshire, one ninth below that of the five Western Counties, and nearly a quarter below the general average of England and Wales. That deaths from Consumption (including strangers,) are less in this district in the proportion of 28 to 39, and those from diseases of the liver and digestive organs, in the proportion of 8 to 13 as compared with the same general average.

The following table shews that the same advantage exists on a comparison with those places which are usually recommended in this latter class of affections.

	Diseases of the Digestive Organs.			Diseases of the Nervous System.		
	Total.	Males.	Fem.	Total.	Males.	Fem.
Brighton........	9.2	8.1	10.4	13.3	14.0	12.7
Leamington	8.0	8.6	7.4	10.6	12.6	8.6
Clifton	7.2	7.1	7.4	15.1	17.0	7.4
Cheltenham	7.0	6.9	7.2	9.0	10.8	7.5
Hastings........	6.3	7.8	4.9	17.7	17.0	18.5
Isle of Wight....	6.1	7.2	5.1	13.5	12.7	14.3
Torquay & Newton	5.3	6.0	4.6	9.2	10.3	8.2
England........	6.8	7.1	6.6	14.0	15.5	12.6

This statement shews the proportion out of a given number of deaths which was occasioned by these maladies, the proportion as compared with the population would be still more striking, as the total mortality in Torquay is remarkably small.

Number of persons out of whom one dies on an average in every year—

Torquay		1 in 61
Newton Union		— 58
Devon		— 53
South-Western Counties		— 52
South-Eastern	ditto	— 52
Welsh	ditto	— 51
Eastern	ditto	— 49
South Midland	ditto	— 48
North Midland	ditto	— 48
Northern	ditto	— 46
Western	ditto	— 45
York	ditto	— 45
Metropolis	ditto	— 39
North-Western	ditto	— 37
England and Wales		— 45
France		— 42
Prussia		— 38
Austria		— 33
Russia		— 28

The quotation for Torquay is given on the assumption that the present population is 8000, and the average for the last five years 7000, (the numbers at the census in 1841 were 5982, and in 1831, 3582.) also that from the annual average of 127 deaths 12 may be deducted as invalid strangers.

From the preceding statements it appears—1. That the mean annual temperature of Torquay, even at Woodfield, is higher than at any other place in Great Britain or Ireland; that this advantage is felt in the cold months, the summers being cooler than at most other places, in about the same proportion that the winters are warmer—the climate being more equable. The mean annual temperature however affords but an inadequate idea of this advantage, being frequently almost the same in climates where the extremes greatly vary; for instance, the difference between the means of Torquay and Chiswick is only 2.2 whilst the difference of range between the extremes is 16 degrees. During the last quarter the temperature of Bath was 14 degrees higher, and also 12 degrees lower than in Torquay. The difference of range being 26 degrees!

2. That the number of days upon which rain falls is less in Torquay than in any other place in England; and that the total

amount is 16 inches less than at Penzance, 4 inches less than at Clifton, and two inches below the general average.

3. That Torquay possesses a drier air than any place mentioned in the Registrar-General's report, except Chichester, exceeding Brighton by nearly 3 degrees, London by more than 2, during the last quarter, and Clifton on an average of years by more than 3 degrees annually. That the east wind is a sea breeze—an advantage peculiar to this coast.

4. That the mean annual mortality in Torquay is only 1.60, whilst in the Newton Union generally it is 1.72, in Devonshire 1.89, in the five Western Counties 1.93, and in England and Wales 2.20. That this superiority exists in the Newton Union in regard to diseases of the nervous system and digestive organs, for which this climate has generally been considered unfavourable, in the proportion of 8 to 13, and in consumption (including strangers) of 28 to 39, as compared with the general average.

5. That in regard to the longevity of its inhabitants the county of Devon is inferior only to Cumberland, and above the general average of England and Wales in the proportion of 300 to 220, as shewn in the numbers of deaths out of every thousand which occurred above the age of 60 years.

As compared with Penzance, Undercliff, Clifton, and Hastings, places which most resemble Torquay, the result is as follows:—

Torquay is warmer than Penzance throughout the year by 0.3 degrees, the winter temperature being precisely the same, even at Woodfield, and in the more sheltered parts of the town considerably higher. The number of days upon which rain falls are 46 less at Torquay than Penzance, and the total amount in inches 16.46, or nearly two fifths less. Penzance has the advantage of Torquay in equability of temperature by two degrees, being as 49 to 51.

Torquay (Woodfield) is warmer than the Undercliff in the Isle of Wight by 0.8 of a degree throughout the year, the advantage being confined to the spring, the temperature of Undercliff is somewhat higher during the autumn and winter than Woodfield, but lower than in the more sheltered parts of the town. Rain falls in Torquay on 14 days less than at Undercliff, but the amount in inches is 4.72 more.

Torquay (Woodfield), is warmer than Clifton in winter by 4.1 degrees, whilst it is cooler in summer by 2.6 degrees mean temperature, the spring and autumn being also in favour of Torquay. Rain falls at Torquay on 37 days less than at Clifton, and the total amount is less by 4.36 inches.

Torquay (Woodfield), is warmer than Hastings by 5.0 degrees in winter, and cooler by 0.5 degrees in summer. The number of days upon which rain falls is 21, and the amouut in inches 4.61 less in Torquay.

Cove, in the South of Ireland, most closely resembles Torquay, being 0.1 of a degree warmer both in winter, spring, and summer, the difference in autumn being 1.1 degree in favour of Torquay. The number of days on which rain falls is also nearly the same, the excess being in winter at Cove and in summer at Torquay.

From this it appears that the winter temperature of Torquay, even on the north-western aspect of one of the hills, is superior to any other place in England, with the single exception of the limited district of the Undercliff in the Isle of Wight, whilst in the more sheltered portions of the town, and warmer aspects it is decidedly superior even to this. That the climate of Undercliff is merely local is obvious on comparing the temperature of Newport with that of Exeter and the surrounding districts, the difference in winter being greatly in favour of Devonshire. Indeed the principal advantage of Torquay consists in the great extent of country around, where the climate is almost equal to its own.

The singular discrepancy between the generally received opinion upon these points, and the facts, as now proved by accurate observations, may readily be accounted for. It was naturally inferred, that if Torquay was warm in winter, it must be hot in summer, and the confined situation and character of the original town confirmed this idea ; the contrary is however the fact ;—the sea breeze, always equable in its temperature, which produces a mild winter, necessarily occasions a cool summer ;—an island, or a peninsula is always more temperate than a continent in the same latitudes. In regard to the fall of rain in Devonshire, the amount being very great in Dartmoor, the only spot where it had formerly been registered, was naturally taken as the estimate of the county. Observation has proved, on the contrary, that the proximity of the high range of Dartmoor causes the amount which falls in the lower districts to be considerably below the average. The humidity of our atmosphere was inferred from the prevalence of the sea breeze, under the idea, that air passing over water must always be more charged with moisture than that which passes over land; in winter this is the case, but in summer less evaporation takes place from the cool surface of the sea, than from the heated soil,—the effect is that an equable dew point is produced at all seasons.

Upon the same principle we may account for the summers in Torquay being cool, whilst the winters are mild; an overland wind is heated in summer by the radiation from an arid soil, and chilled in winter by its passage over a frozen surface—the sea breeze on the contrary is equable. The east and south-east winds, which are generally the hottest, are in Torquay a sea breeze, giving us a great advantage over the North of Devon and the inland districts, which, in ignorance of this fact, are frequently recommended as affording a cool summer residence. When Torquay consisted of only the confined houses around the harbour, the complaint might have been true, from the local radiation, which in winter is so valuable; but as the town now extends almost to the summit of the surrounding hills, there is not a spot on the coast where so free a circulation of air, and so cool a temperature can be enjoyed, or where the diversities of aspect and luxuriance of foliage afford such refreshing shade.

In the tables which are appended to the last edition of Sir James Clark's justly celebrated work on Climate are embodied the observations which have been taken during the last five years at Woodfield. These place Torquay in its just position, but unfortunately a corresponding alteration has not always been made in the text, and as the generality of readers are satisfied with the opinions expressed in the body of a work, without troubling themselves to examine the tabular statements, the erroneous opinions which had been hazarded in former editions, being retained in this, will tend to confirm the error from their appearing to rest upon statistical data.

At page 139 it is stated, "although at Torquay the temperature sometimes rises higher, it likewise sinks lower than at Undercliff, giving the latter the advantage in point of equability of temperature." Now on referring to the tables it appears that the extreme range of temperature at Torquay and at Undercliff during an average of years was as follows :—

	Annual.	Winter.	Spring.	Summer.	Autumn.
Torquay............	51	29	42	30	38
Undercliff	57	29	43	35	42

So that instead of the difference being in favour of Undercliff, it is six degrees in favour of Torquay. This is confirmed by Table III of the previous edition, which stated the absolute highest and lowest points registered by the thermometer, the quotations for Undercliff being 81° 26°,—Torquay (Woodfield 1842 to 1845 which does not appear in that edition) 77° 26°.

This also shews that the extreme heat of Summer at Undercliff is four degrees higher than at Torquay, notwithstanding which fact Sir James Clark adds "Up to the middle of August the climate of the Undercliff is pleasant; the sea breeze, which in fine weather usually sets in about seven o'clock in the morning, is very refreshing and prevents the solar heat from becoming oppressive." Of "the relaxing and enervating effects'' of a residence on the Coast of Devon, on the contrary, he repeats his former remarks, limiting a sojourn at Torquay to the winter and spring and stating, as a matter of notoriety, that "many invalids derive in two or three months, or even a shorter period, all the benefit which the climate affords. Others cannot remain above a few weeks without suffering" &c.! Surely so decided an opinion, coming from what is justly considered one of the highest authorities, ought to be founded upon some data.—If a relaxing climate mean one that is warm and moist, we should expect to find the climates of Torquay and Undercliff strongly contrasted in these respects in the Meteorological Tables; but the contrary as we have seen is the fact.

As compared with Clifton, another spot which is recommended as having a *bracing* air, the contrast is still more favorable to Torquay both in regard to temperature, dew-point, and fall of rain. The annual amount of which at Clifton is 4.36 inches greater, and the number of wet days 37 more than at Torquay. Still Sir James decides that "the fall of rain at Clifton is absolutely less than in Devonshire," and that "the vicinity of Bristol and Clifton is the mildest and driest climate in the West of England, and consequently the best winter residence for invalids in that part of the country"! which is correct—the text or the tables? The mortality of Clifton and the adjoining rural districts, is 1 in 46, that of the Newton Union 1 in 58, Torquay 1 in 61.

The fall of rain at Sidmouth is stated in the tables to be only 22.68 inches,—this appears to have arisen from an oversight in Dr. Cullen's figures—he states the fall of rain in the year 1845 to have been only 14.10 inches, whilst in the 9 months of 1843 there had been 30.36! (see note p. 407,)—the amount at Sidmouth is unquestionably greater than at Torquay, which is 28.20.

It is very certain that *practically* neither heat nor moisture are found to be in excess in Torquay. A steaming apparatus is a very common appendage to the sick room, for the purpose of increasing the humidity; and no invalid, whom prejudice has allowed to remain during the summer, has found reason, in the airy parts of the town, to complain of heat, although this arises from no lack of sunshine. "Sunny Devon" is the epithet chosen by one to whom the *Quarterly* has given the palm amongst the Poetesses of England, and whose long residence here as an invalid gives value to her impressions.—The gardener would gladly accept double the average quantity of rain during the spring and summer months, with more of the muggy growing days with which he is tantalized, and a share of the sultry heat of the *bracing* counties. Spring planting and spring-sown annual and grass seeds are almost invariably failures from drought; and grapes, nectarines, figs, and other fruits very frequently fail from the want of sufficient heat to ripen them.

Dr. Shapter in his Climate of Devon, attributes this to "the peculiar prevalence of cloud" "for" he adds "as far as mere temperature is concerned there is no reason whatever for their not ripening sufficiently, but the absence of the direct rays of the sun, prevents the perfect developement of flavour." The erroneous opinion here expressed in regard to the high temperature of South Devon, arises from an oversight in his tables of the maximum temperature at page 8, where the *extreme* highest temperature in Exeter is compared with the *mean* highest temperature of London; the same error was committed in regard to the minimum temperature, which led to the apparently excessive variations upon which he comments, and which he now authorizes me to correct. Dr. Shapter's opinion of the Climate of Exeter is not so favourable in regard to the prevalence of cloud, and the humidity of the atmosphere, as the comparison which has been given above with Clifton and other places would warrant, although in these respects Exeter is undoubtedly inferior to Torquay. The luxuriance of our vegetation, which is often adduced as an evidence of the humidity of the atmosphere, is really owing to a fertile soil, as is evident from the failure of crops on the hills, where the soil is thin.

Dr. Granville's unfavourable opinion of Torquay, is founded upon an error in his own figures. As this has been extensively circulated in the Spas of England, it will not be out of place to shew how it occurred. After referring to Dr. Barry's tables, in which he quotes the temperature of January, February and March, 40.3 43.4 and 45.6 respectively, he adds, "but we have already seen that the mean temperature at Clifton and Bath was higher during those months and years, having extended from 44 degrees even to 49 degrees, and therefore the contrast between Torquay and those places, with which in truth it ought to be compared, is not in favour of the latter." (p. 488.) On referring to his chapters on Bath and Clifton, the following appear to be the only passages at all bearing upon the temperature. "The absolute lowest temperature (of Clifton) had seldom been more than 11 degrees below the freezing point, and that only for one day, and the highest was 85 degrees." Of Bath he adds, "In several of what are called the cold months elsewhere, November, December, January, and February, the temperature of the external air at three o'clock in the afternoon has often been 44-5-6-7-8 and even 49 degrees, which bespeaks the mildness of the climate in winter." (p. 360.)

Now in the first place the comparison is not made between the same years, Dr. Barry's table was computed from observations taken between the years 1828 and 1838, that of Mr. Biggs at Bath, from the years 1839 and 1840.

Secondly "44-5-6-7-8" and even 49 degrees is not the *mean* temperature of Bath, but (as Dr. G. himself expressly states, p. 360,) the *highest extreme* at 3 o'clock in the afternoon.

In regard to the amount of rain which falls in Torquay, as compared with other places, Dr. Granville again hazards an opinion,—"everybody knows that it rains a *very great deal* in Devonshire, and certainly not less at Torquay than in other parts of the coast of that county." If he had examined the table which had been published by Dr. Barry, in the Environs of Torquay, he would have found, that, in the year to which he referred, there had fallen at Torquay, 3.8 inches less rain than at Exeter, 5-5 less than at Plymouth, 8.6 less than at Plympton, and that in the month of September alone 3.5 inches less rain had fallen at Torquay than at Moreton; the excess was doubtless still greater in the higher parts of the moor.

With the same contempt for his own figures which he had exhibited in his Meteorological statements, Dr. Granville denies that the climate of Torquay is beneficial even in Consumptive cases for, says he, 31, of its 5600 inhabitants died of consumption in two years; if he had compared this proportion with that of England and Wales generally, he would have found that it was more than a quarter below the general average, and considerably lower than that of any other district in the kingdom. "The awful and thrilling effect of the frequent tolling of the funeral bell" is doubly a fiction, as it is not audible in the town.

From the preceding remarks, quoted from medical writers, which are unfavourable to Torquay, it must not be inferred, that their opinions are unfavourable upon those points, upon which they had the means of arriving at a just conclusion, either by personal observation, or accurate report;—on the contrary, Sir James Clark, who has occasionally visited Torquay, gives the most flattering description of its situation and general advantages, and, in spite of the erroneous tables in his first edition, gives a very high opinion of its climate, with some exceptions, which we have seen to be founded in error—"The general character of the climate of the South-west coast is soft and humid. Torquay is certainly drier than the other places, and almost entirely free from fogs. This drier state of the atmosphere probably arises, in part, from the limestone rocks which are confined to this neighbourhood, and partly from its position between two streams, the Dart and the Teign, by which the rain appears to be in some degree attracted. Torquay is well sheltered from the north-west, and is in a great measure protected from the north-east wind, the great evil of our spring climate. This protection from winds extends also over a very considerable tract of country, abounding in every variety of landscape, in which the invalid may find, at all times, a sheltered spot for exercise, either on foot or horseback. The beauty of the country around Torquay, and the manner in which it is sheltered from all winds,—combining also as it does, in the highest degree, all the favourable qualities of the south-western climate—are advantages of great importance to the invalid, and which Torquay possesses to a greater extent than any other place on this coast.

Whenever Sir James Clark had the means of judging correctly his opinion is decidedly favourable to Torquay. Even Dr. Granville whose solitary visit of a few hours rendered it impossible that he should speak from personal experience upon any other point, describes our November climate, as "genial and pleasant as a clear, calm, and summer evening in the south of Spain!" Rather an exaggeration even its warmest advocates will admit, but far nearer to the truth than the opposite statements, referred to above, and the general impression of Torquay, which his sketch is calculated to convey, in its minor details, most of which are pure romance.

The Meteorological Journal for Torquay is regularly published in the *Torquay Directory;* to which will now be added a very valuable series of comparative observations, which has been commenced by the Registrar General in his Quarterly Reports. These statements will shew more forcibly than any tables of the *mean* temperature the actual superiority of Torquay, which is most felt in seasons of unusual severity, or periods of excessive heat. For instance, although but little difference is shewn between their mean temperature, in the preceding tables, the difference between the extremes at the following places during the severe winter of 1837-8 as given by Dr. Barry was as follows:—Torquay 21°, Exeter 17°, Chichester 9½°, Bristol 8°, Kensington 0°, and Sandhurst 8° below zero! The superiority of the climate of Torquay during the extreme heat of the past summer has been shewn at page 4, proving it to be the coolest place in England, with the exception of parts of Cornwall, which confirms the principle upon which the cool summers of Torquay have been accounted for.

COCKREM, PRINTER, STRAND, TORQUAY.

ADDENDA.

The following summaries are deduced from the Quarterly Reports of the Registrar General, the details of which have appeared in the *Torquay Directory*. The series commences from the 1st of April, 1847, and affords the only statement of the comparative Meteorology of the several districts of this country upon which any reliance can be placed, having been founded upon observations taken at the same time, and with instruments regulated by the standards at the Greenwich Observatory :—

EXTERNAL TEMPERATURE, IN THE SHADE.

	Highest extreme.	Lowest extreme.	Mean Tempera.	Range of Temp.
To 30th June, 1847.				
Torquay	75	31	52·7	44
Average of England	78	27	50·9	51
Extreme of ditto	87	19	—	65
To 30th September, 1847.				
Torquay	80	44	60·5	36
Average of England	82	36	58·2	46
Extreme of ditto	98	20	—	68
To 31st December, 1847.				
Torquay	64	31	49·4	33
Average of England	67	26	45·8	41
Extreme of ditto	73	14	—	55
To 31st March, 1848.				
Torquay	57	26	43·1	31
Average of England	62	16	38·1	46
Extreme of ditto	71	4	—	56
To 30th June, 1848.				
Torquay	72	37	55·6	35
Average of England	79	28	53·4	51
Extreme of ditto	88	23	—	65
To 30th September, 1848.				
Torquay	75	46	58·0	29
Average of England	82	36	57·4	46
Extreme of ditto	95	29	—	60

HUMIDITY OF THE AIR AND FALL OF RAIN.

	Days of rain.	Inches of rain.	Vapour in cubic foot of air.	Additional vapour to saturate do.
To 30th June, 1847.				
Torquay	39	5·1	3·7gr.	0·7gr.
Average of England	42	6·3	3·7	0·7
Extreme of ditto	58	10·6	4·1	0·3
To 30th September, 1847.				
Torquay	21	3·5	4·7	1·2
Average of England	32	4·6	4·8	0·9
Extreme of ditto	46	9·3	5.0	0·2
To 31st December, 1847.				
Torquay	43	13·7	3·8	0·4
Average of England	43	9·1	3·4	0·3
Extreme of ditto	61	18·6	4·0	0·1
To 31st March, 1848.				
Torquay	52	9·3	3·0	0·4
Average of England	52	9·6	2·7	0·3
Extreme of ditto	67	16·1	3·1	0·1
To 30th June, 1848.				
Torquay	38	9.1	4.0	1.1
Average of England	43	8·1	3·8	1·1
Extreme of ditto	59	11·6	4·1	0·8
To 30th September, 1848.				
Torquay	49	10·4	4·7	1·2
Average of England	50	10·3	4·5	1·0
Extreme of ditto	61	15·2	5·0	0·7

The most important feature in the Climate of Torquay is its *equability*, both as regards the temperature, and the humidity of the atmosphere. The highest point registered during the year 1847, in Torquay, was 80°, and in 1848, 75°, whilst in some other parts of England it was as high as 98° and 95 at the same periods. The lowest temperature, on the other hand, was 31° and 26° in Torquay,—whilst the extreme in other parts was 14° and 4°, shewing six degrees of frost in Torquay, and twenty eight degrees in some other districts, and as much as ten degrees on the average of England.

In regard to the humidity of the atmosphere in Torquay the same equability is found to exist, the greatest amount of vapour in a cubic foot of air, shewing the *actual* humidity, being 4·7 grains, and the least 3·0 grains, whilst on the average of England the amount varied from 4·8 to 2·7 grains. The fluctuation in the *sensible* humidity, as shewn by the additional amount of vapour required to produce complete saturation, was from 1·2 to 0·4 grains in Torquay, 1·1 to 0·3 on the average of England, the difference in either case being the same, but proving that there is less sensible dampness in Torquay than in other parts of England, many of which have hitherto enjoyed the repute of possessing a much more bracing air.

The causes of this superiority are to be found in the peculiar geographical position of Torquay. Its Southern latitude will in some measure account for the mild winter temperature, but the principal cause is the proximity of the sea, which not only encircles the great peninsular of the Western Counties, but also the smaller promontary upon which Torquay is situated, and thus, from its always retaining nearly the same temperature, the sea breeze moderates both the summer heat and the winter's cold. In addition to this, the coast from Exmouth to Start-point having nearly an Eastern aspect, the coldest winds in winter and the hottest in summer are from the sea which tempers, the extremes of each. The same cause also modifies the amount of vapour, the dry East wind being moistened in its passage down the Channel, and the superfluous moisture of the West being abstracted by the high range of Dartmoor.

The full influence of these causes is necessarily confined to the peninsula, of which a line drawn from Tor Abbey Sands to Babbicombe forms the base, within these limits it will be seen that the wind in every point to the Southward of North East and West is a sea breeze, and, as these prevail nearly throughout the year, Torquay is virtually an island, and its climate is as essentially different from that of the mainland, as the climate of Madeira is from that of the Continents of Europe or America in the same latitudes.

The climate of Tor is, for the same reasons, of a very different character; the influence of the sea is only felt when the wind is between the South and East, which is very rarely the case. Those who find the saline character of the sea breeze too stimulating may thus enjoy all the other advantages of the climate, in almost the same perfection, within a very short distance, and by selecting an elevated or a sheltered situation may suit the peculiarities of almost every constitution.

E. V.

Woodfield, Nov. 1848.